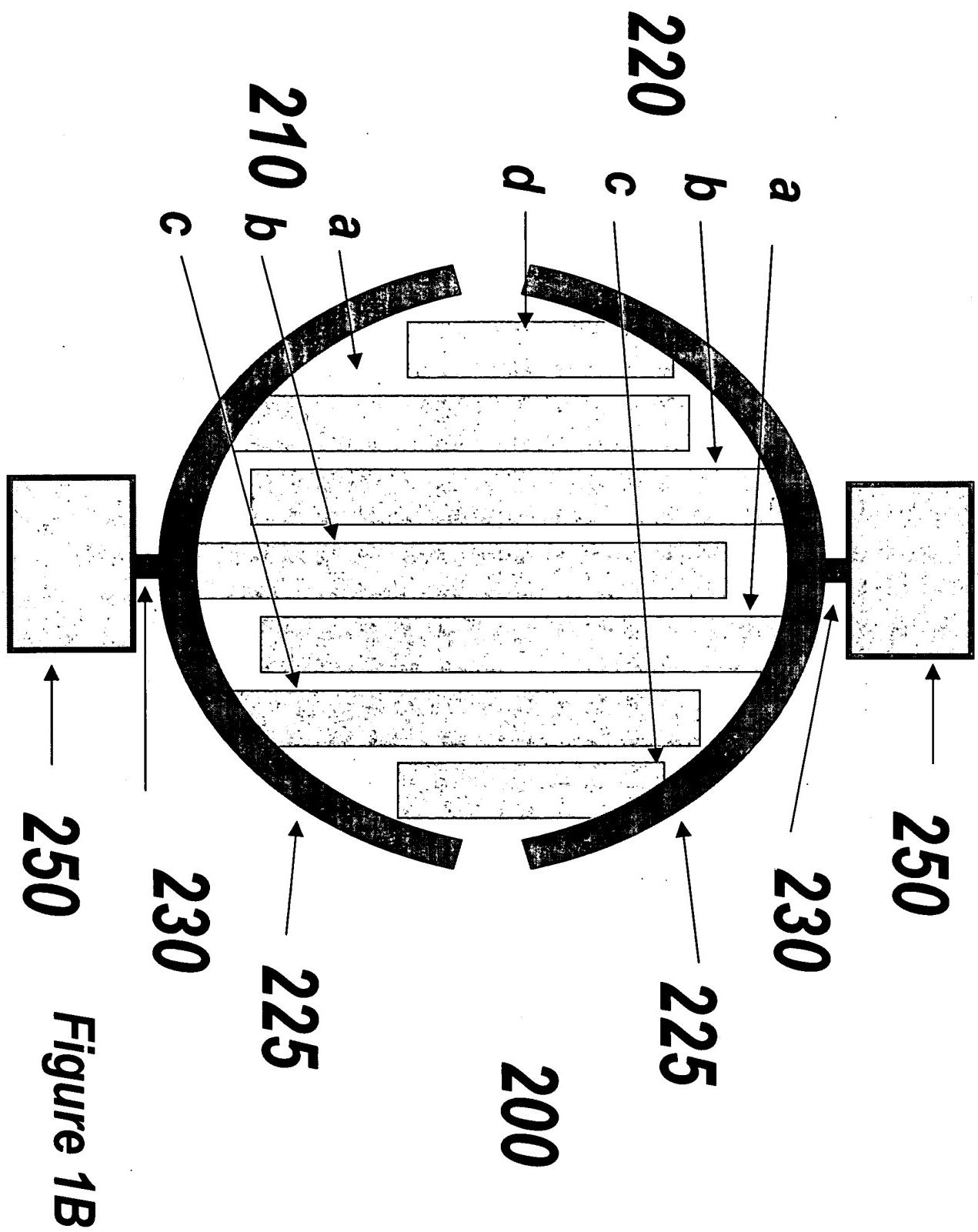


*Figure 1A*



**250**

*Figure 1B*

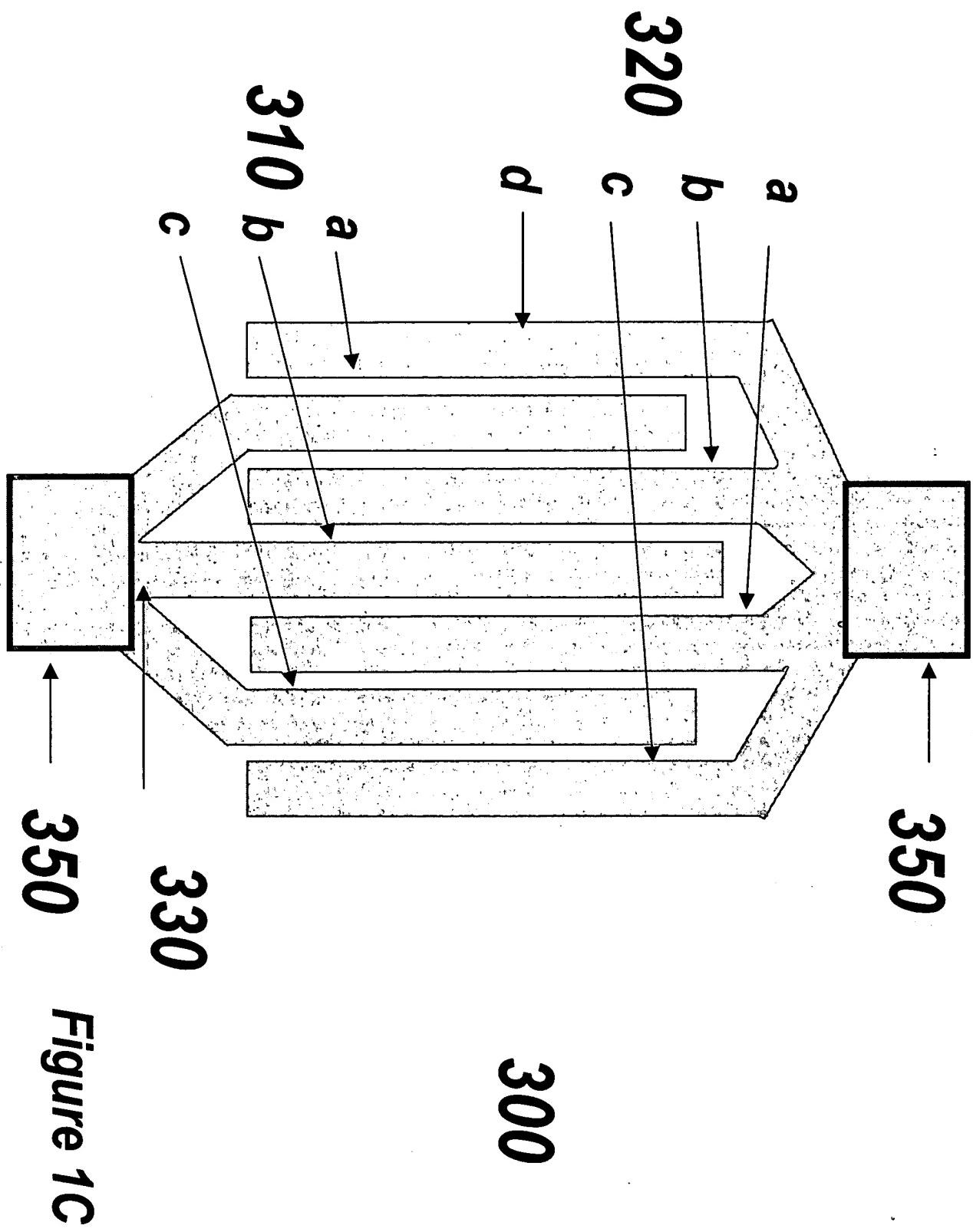


Figure 2

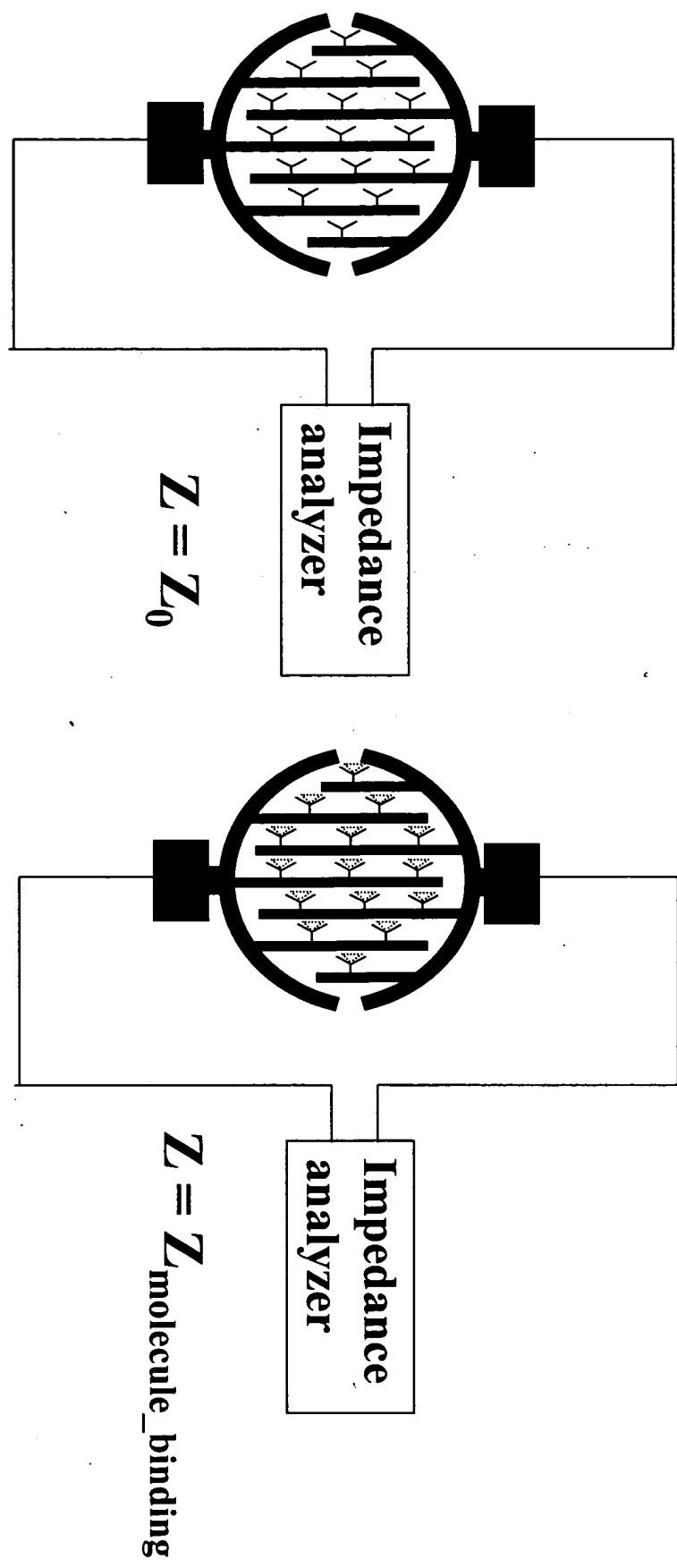
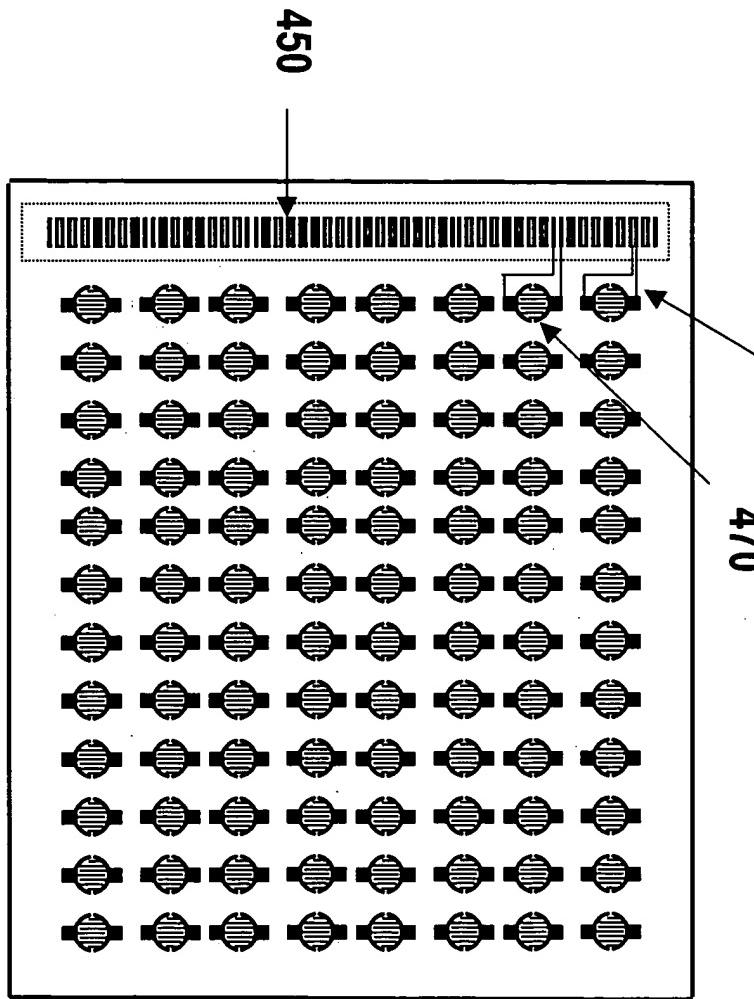


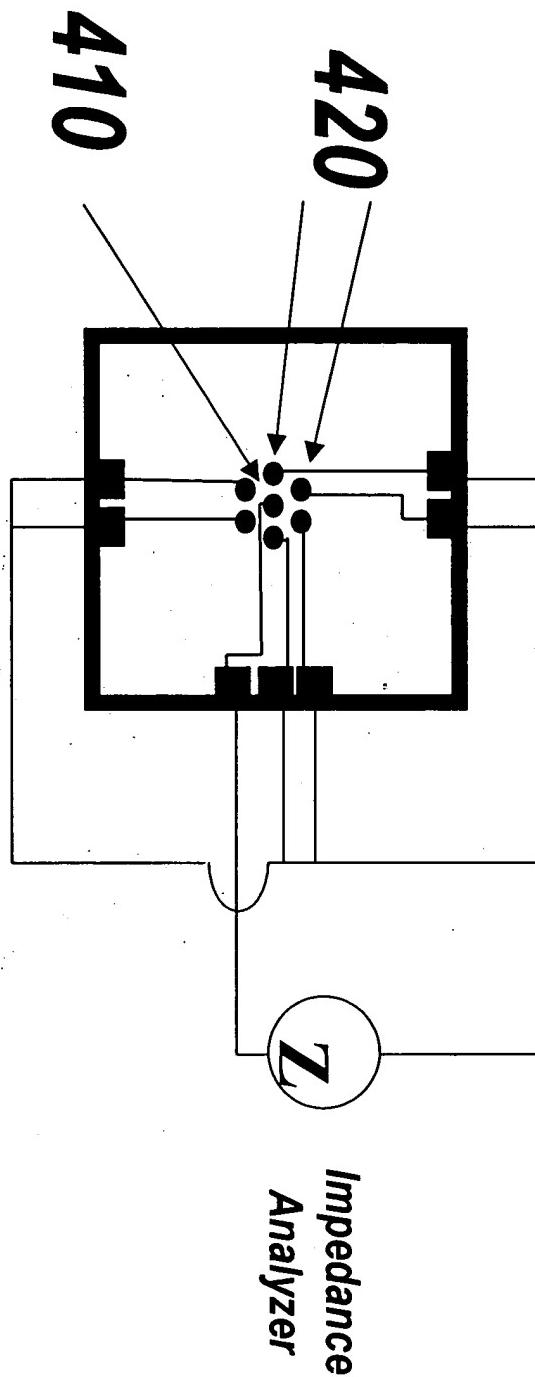
Figure 3

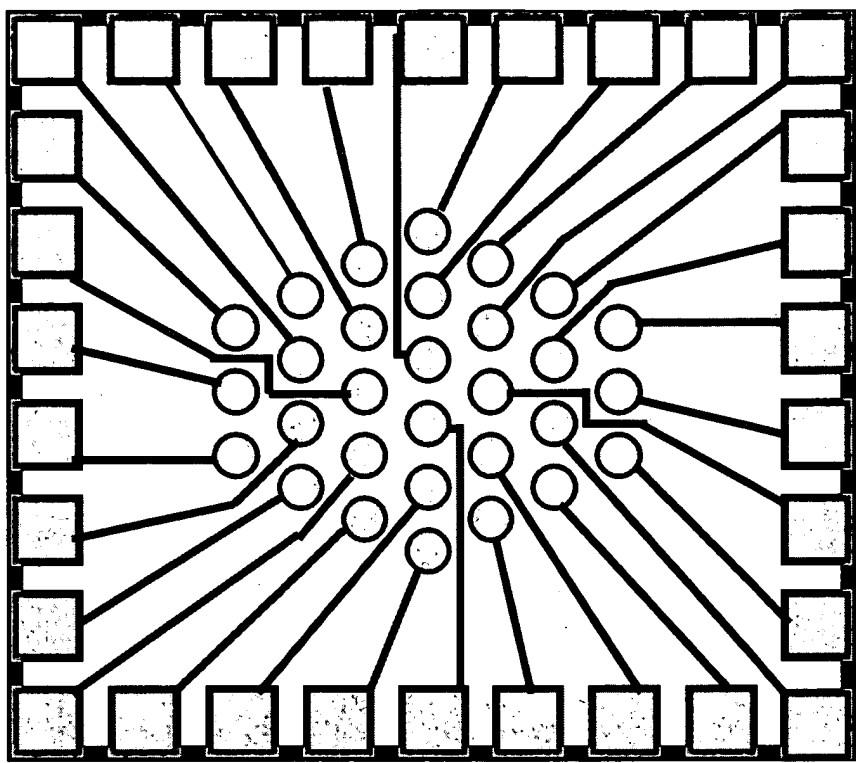
450  
460  
470



Microelectrode plate (96-well plate)

**Figure 4A**





*Figure 4B*

Figure 5

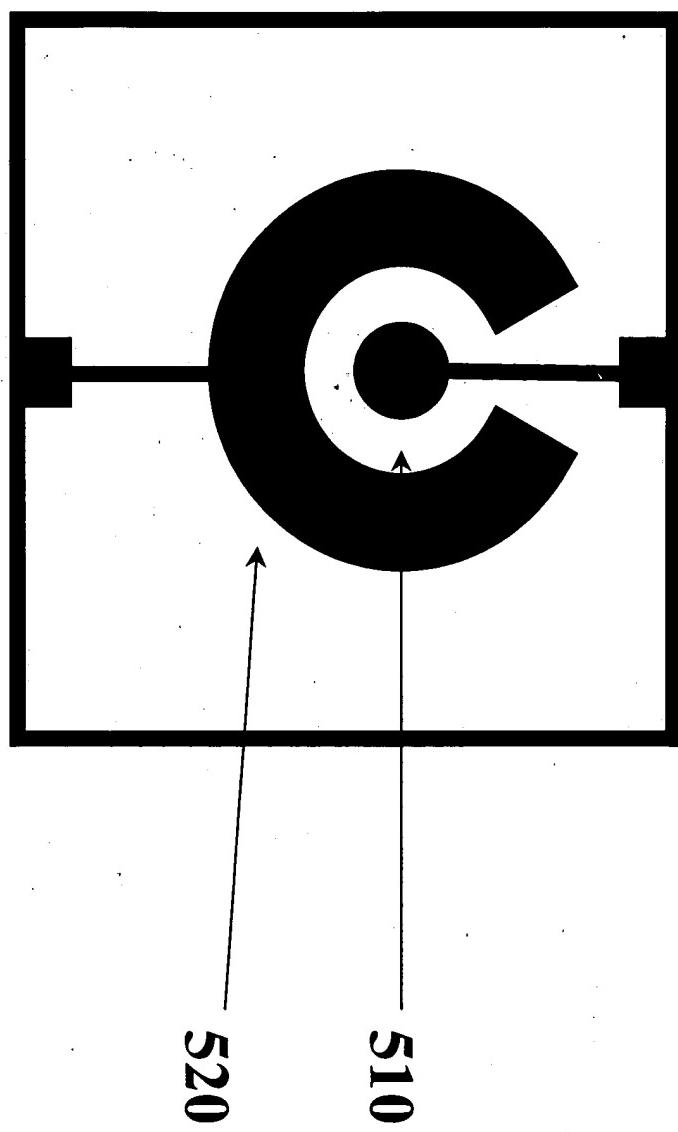
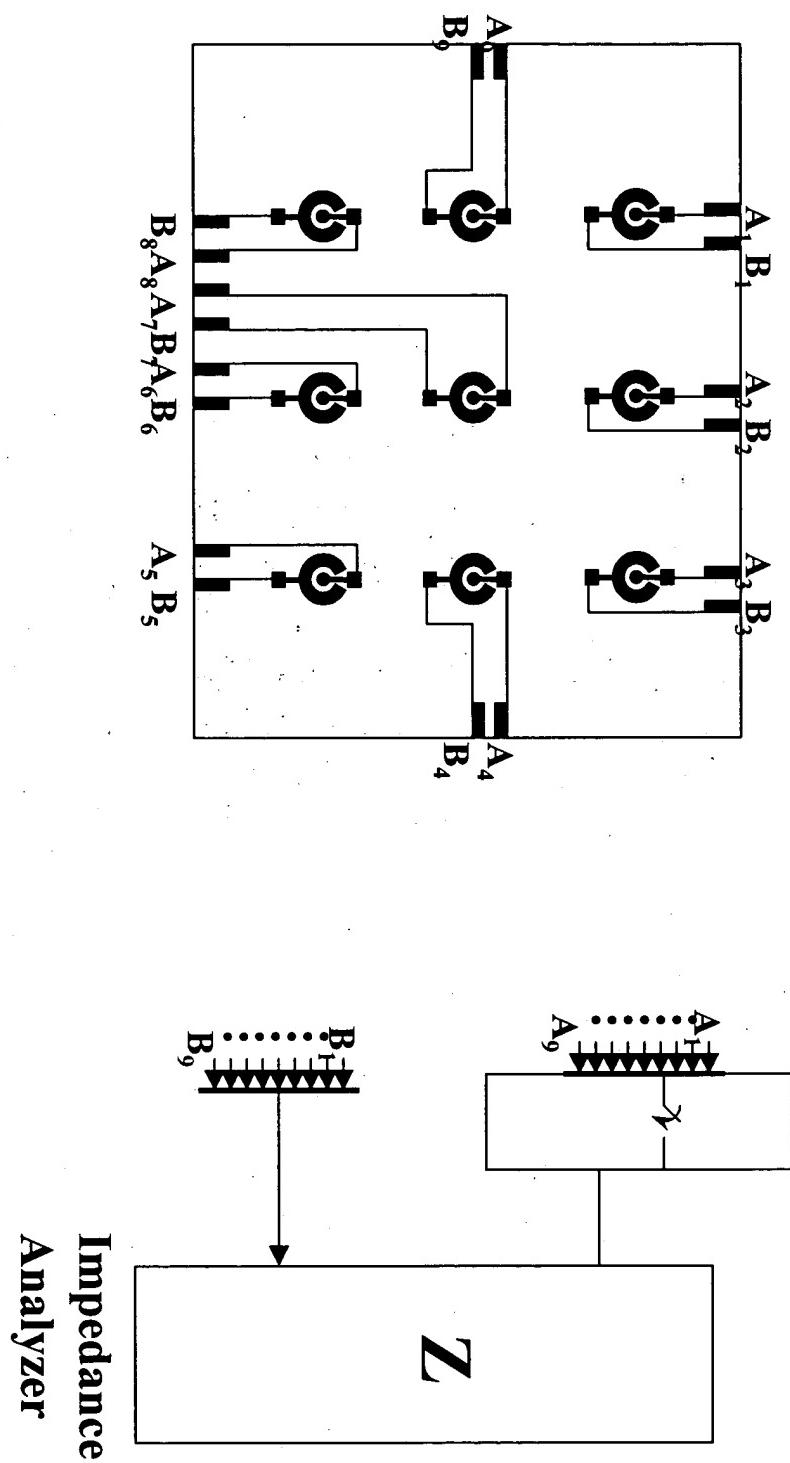
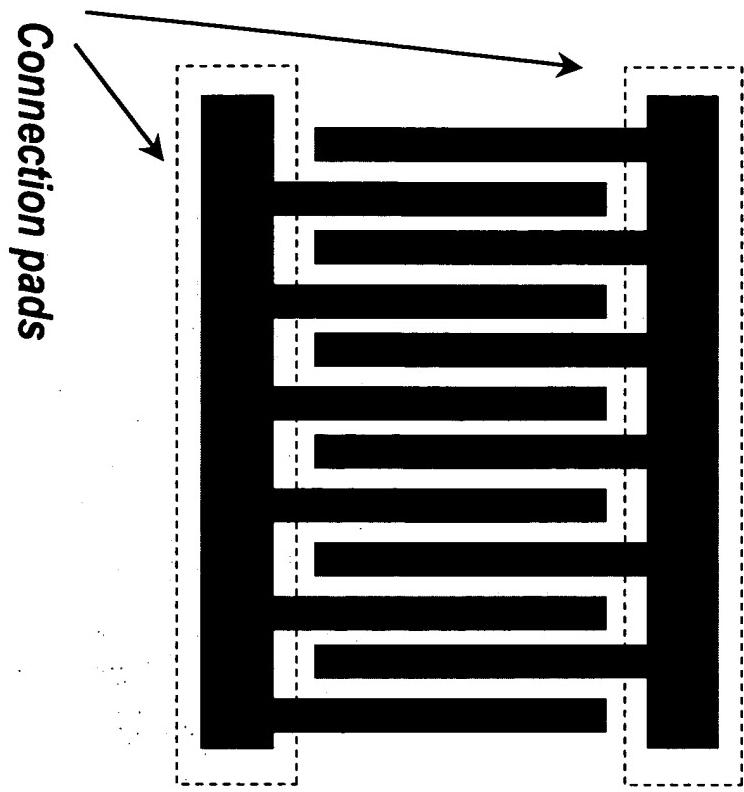
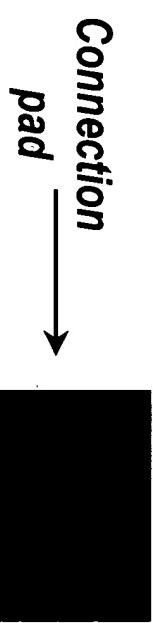


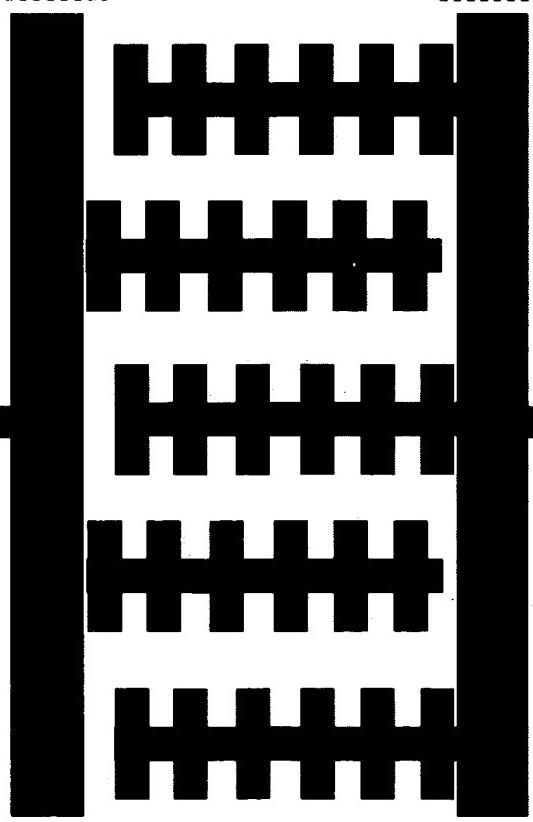
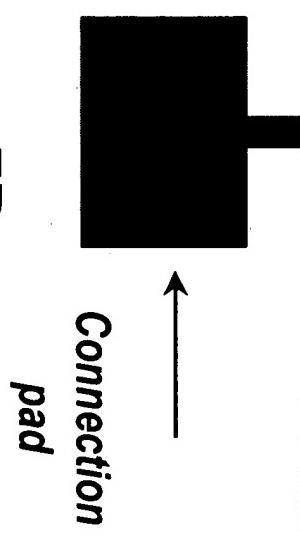
Figure 6



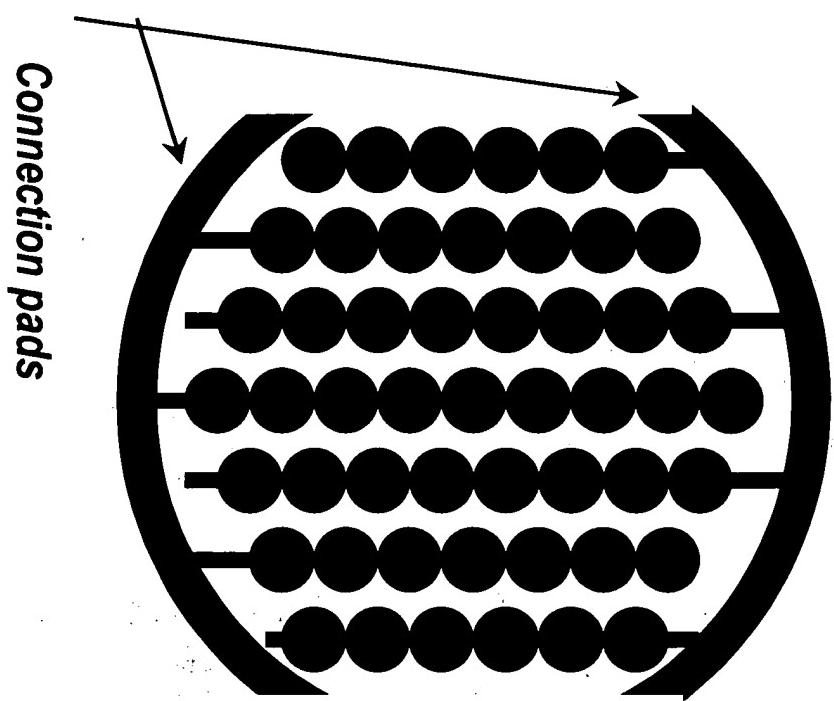
**Figure 7A**



**Figure 7B**

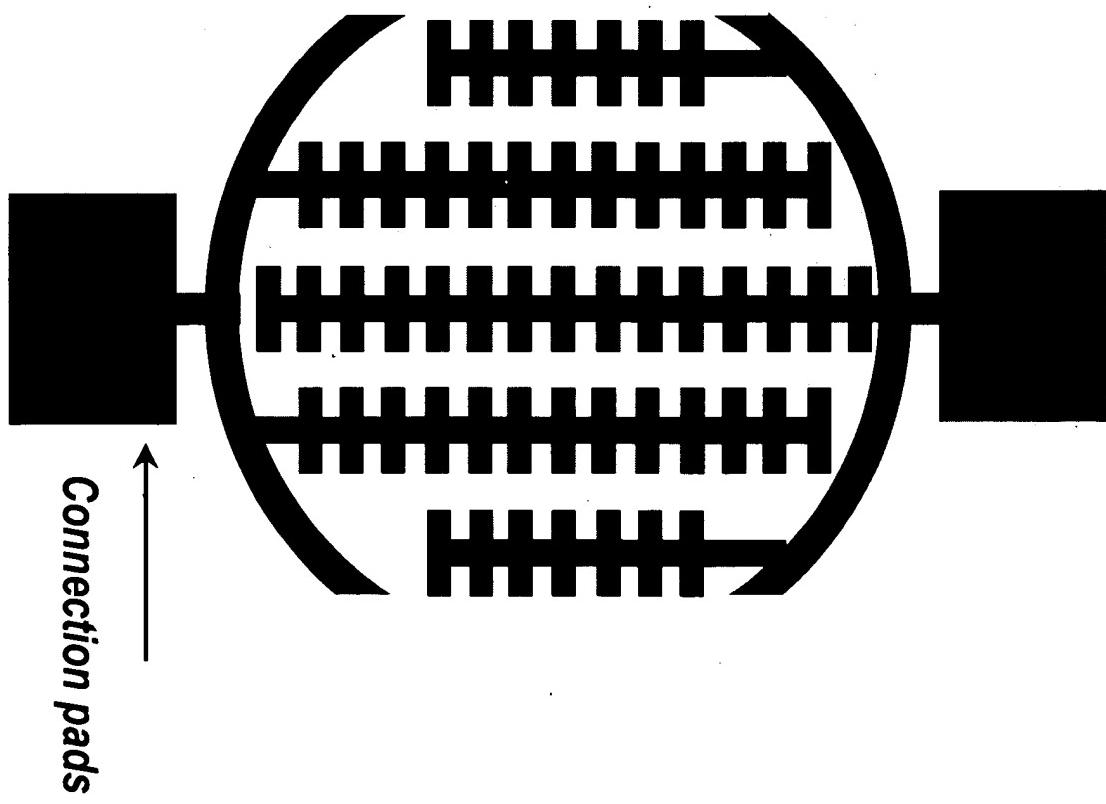


**Figure 7C**

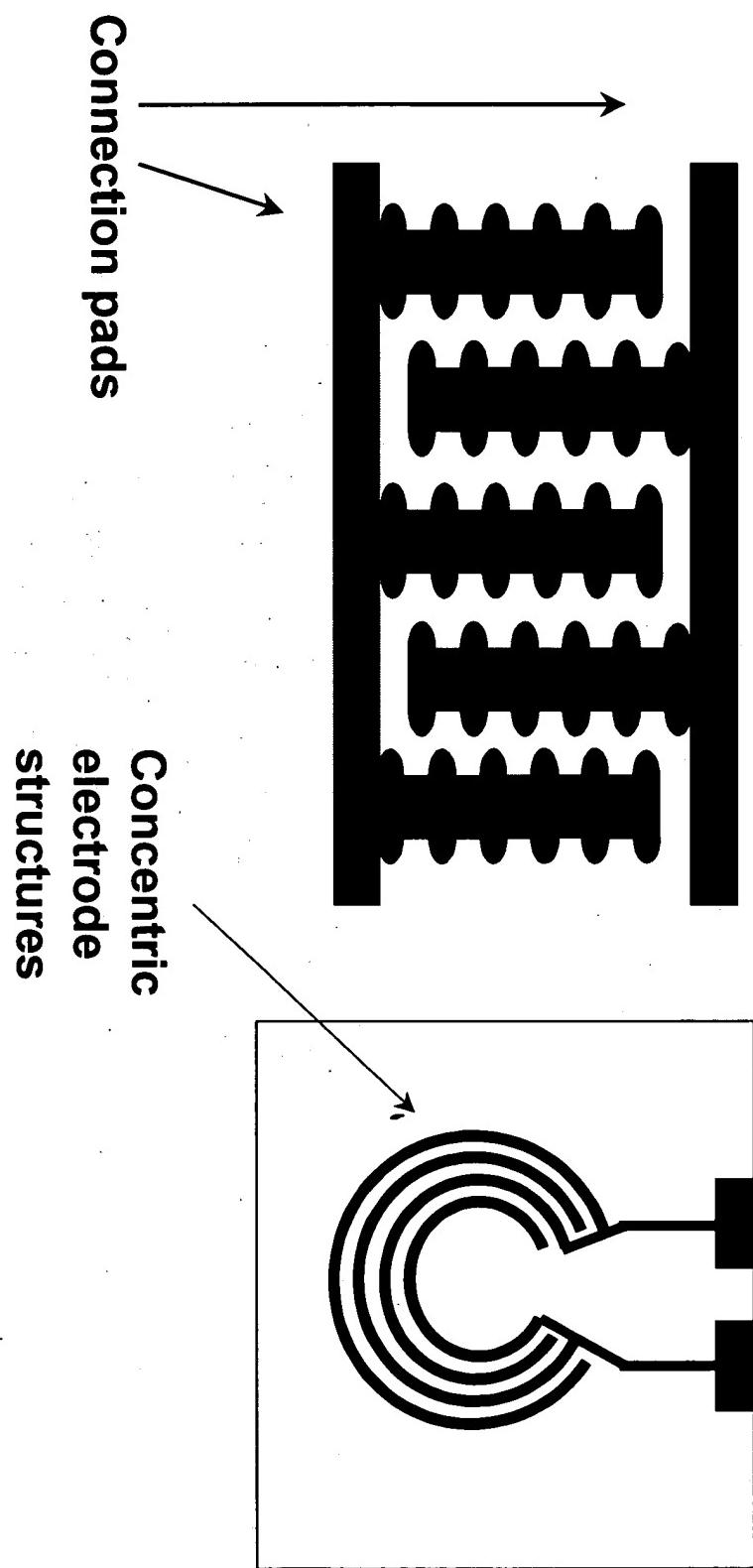


*Connection pads*

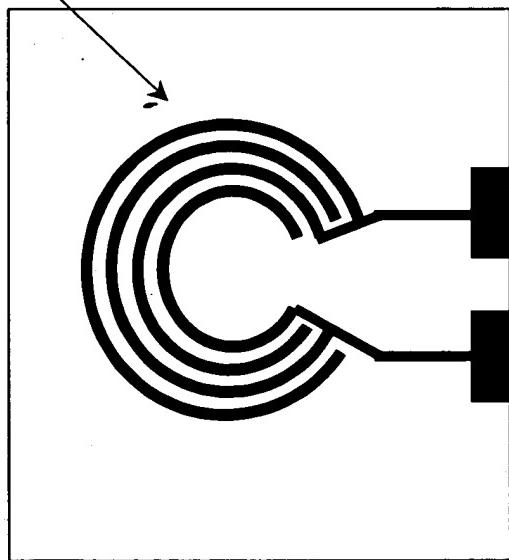
**Figure 7D**



*Connection pads*

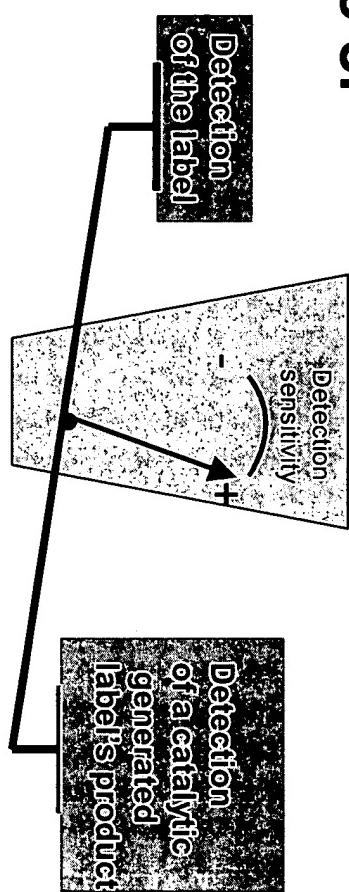


**Figure 7E**



**Figure 7F**

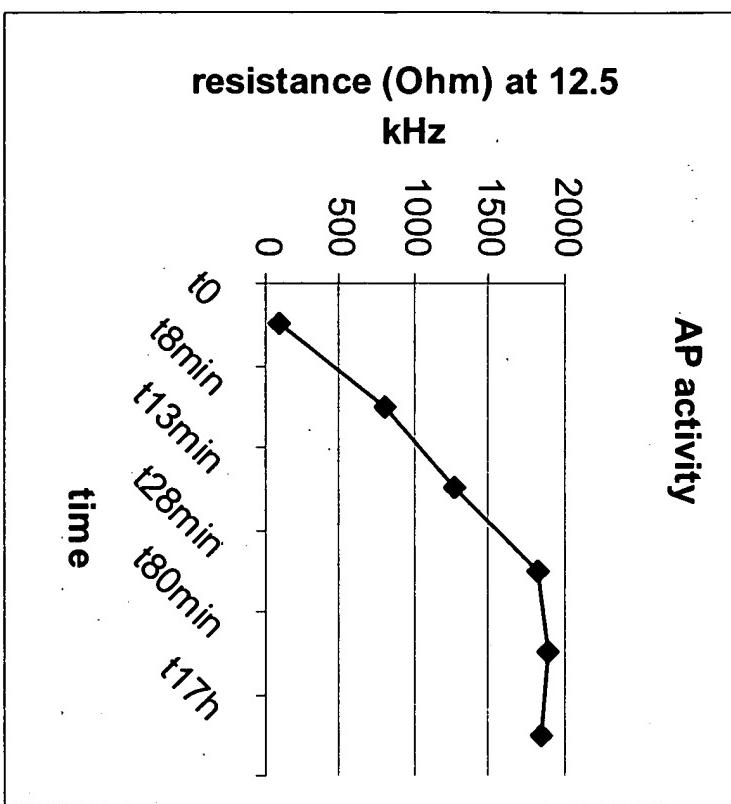
**Figure 8.**



**Signal amplification for improved detection sensitivity by indirect measuring catalytic products of enzyme-mediated reactions. Examples of enzymes commonly used include alkaline phosphatase (AP) and horseradish peroxidase (HRP). Here are some typical reactions used.**

Enzyme	Reagents	Reaction
HRP	4-chloro-1-naphthol (4CN)	Oxidized products form purple precipitate
HRP	3,3'-diaminobenzidine (DAB, with or without $\text{NiCl}_2$ )	Forms dark brown precipitate
HRP	3,3',5,5'-tetramethylbenzidine (TMB)	Forms dark purple stain
AP	5-bromo-4-chloro-3-indolyl phosphate (BCIP) / nitroblue tetrazolium (NBT)	BCIP hydrolysis products indigo precipitate after oxidation with NBT; reduced NBT precipitates, dark blue-gray stain results

**Figure 9.**



Resistance  
(ohm)

82

801

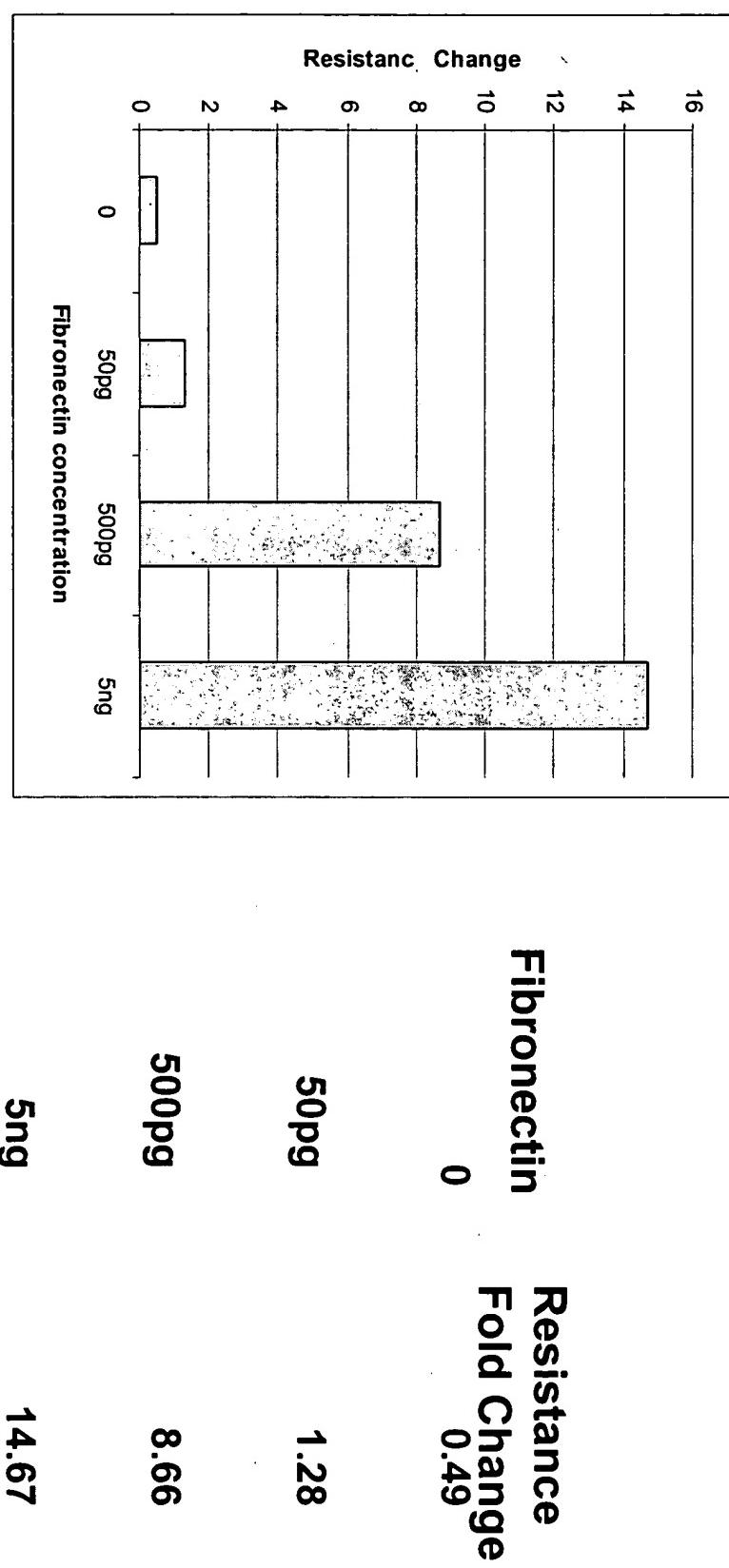
1263

1825

1881

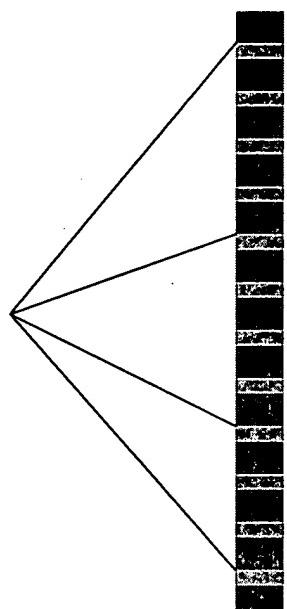
1841

**Figure 10.**



**Figure 11.**

**Microelectrode array strip**



**Microelectrode array**



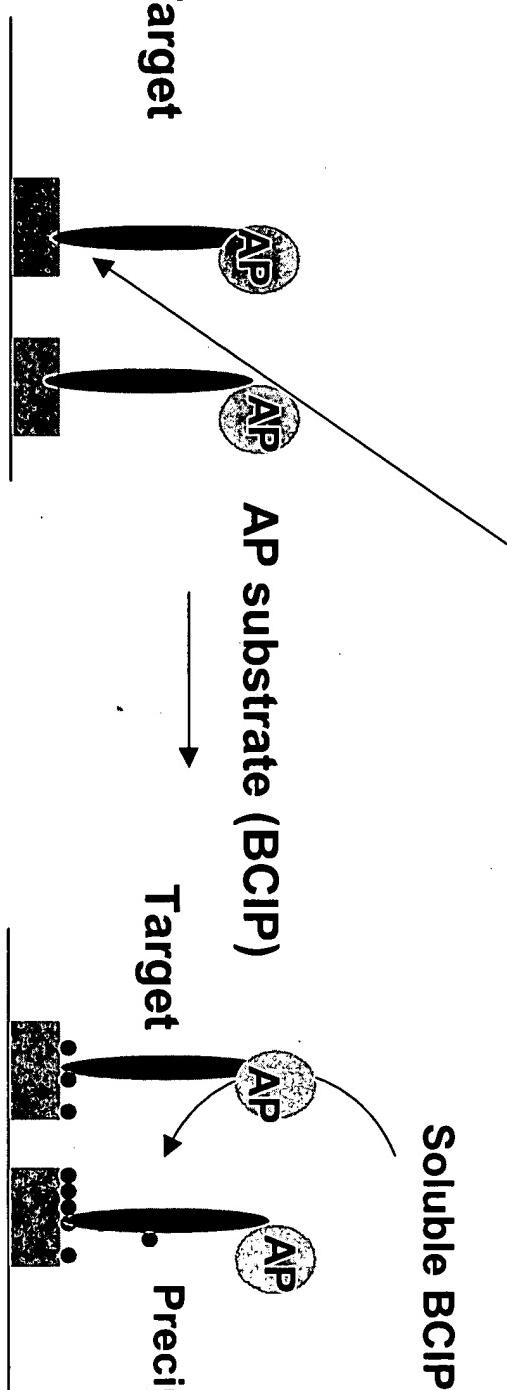
**Soluble BCIP**

**AP substrate (BCIP)**

**Target**

**Target**

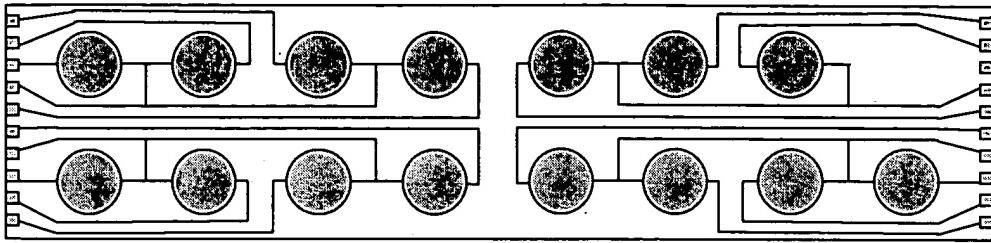
**Precipitations**



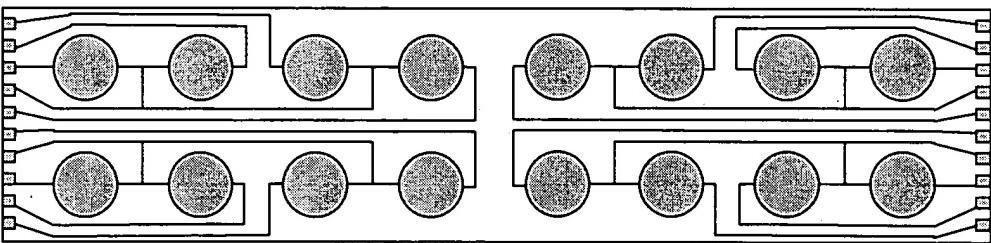
**Impedance  $Z_o$  between Electrodes**

**Impedance  $Z_{mol\_binding}$  between Electrodes**

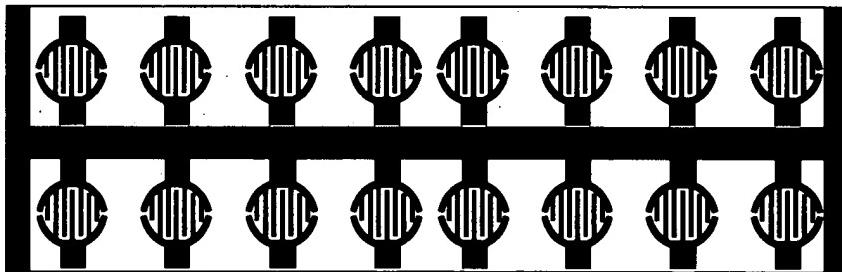
**Figure 12 A**



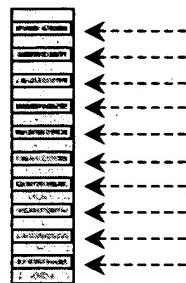
**Figure 12 B**



**Figure 12 C**

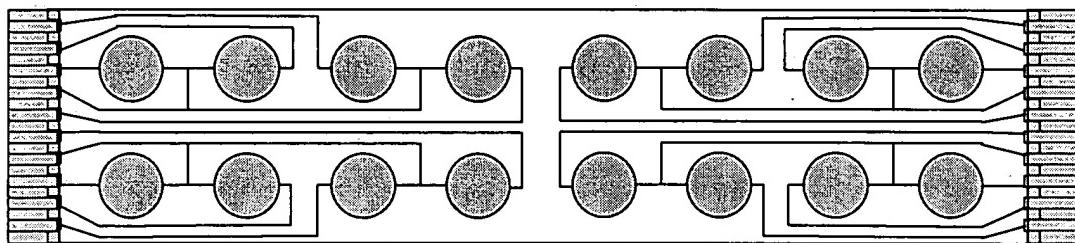


**Figure 13 A**

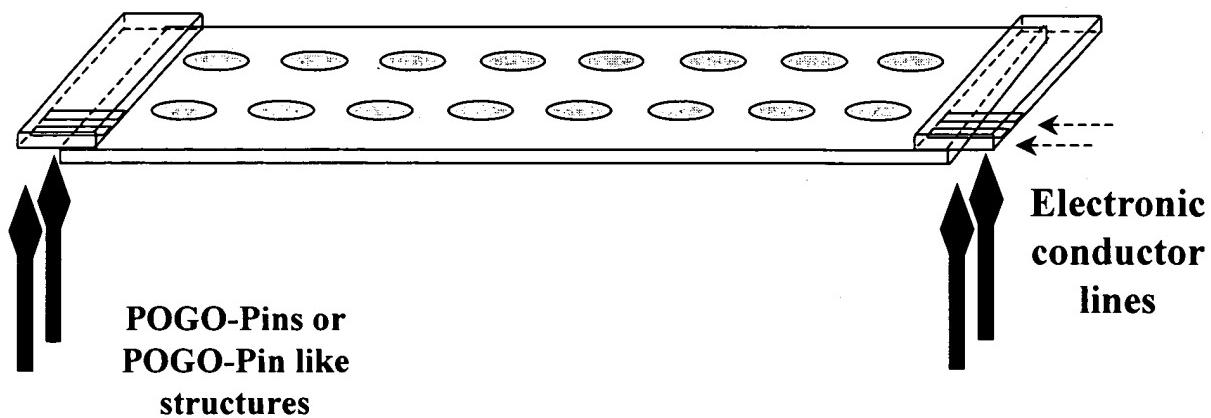


**Electronic conductor lines**

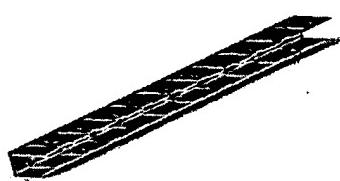
**Figure 13 B**



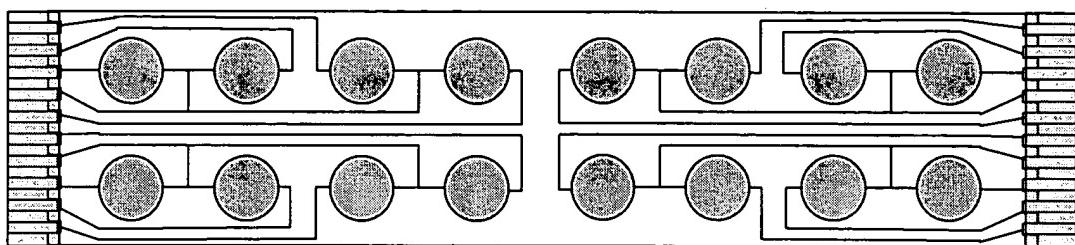
**Figure 13 C**



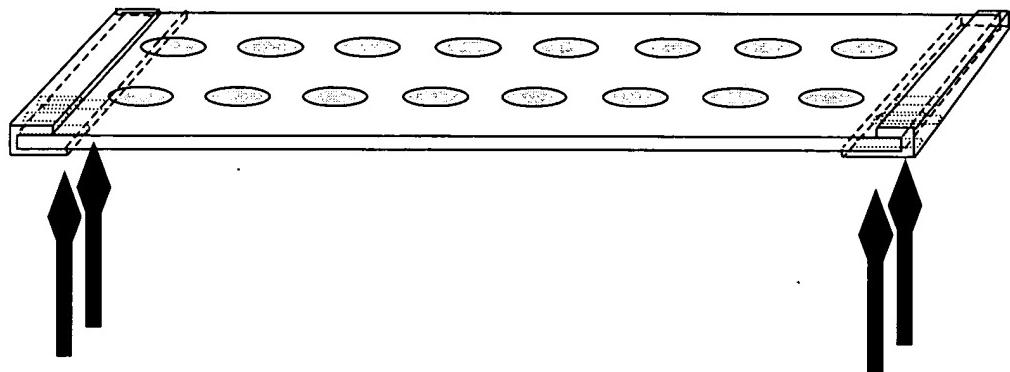
**Figure 14 A**



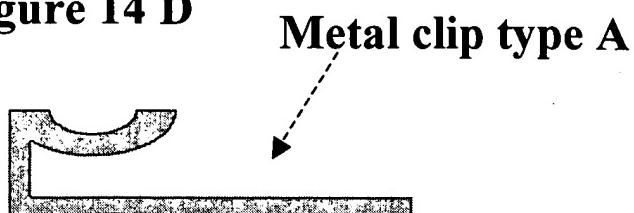
**Figure 14 B**



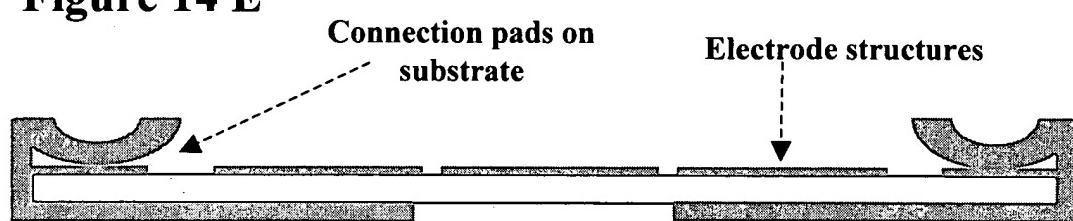
**Figure 14 C**



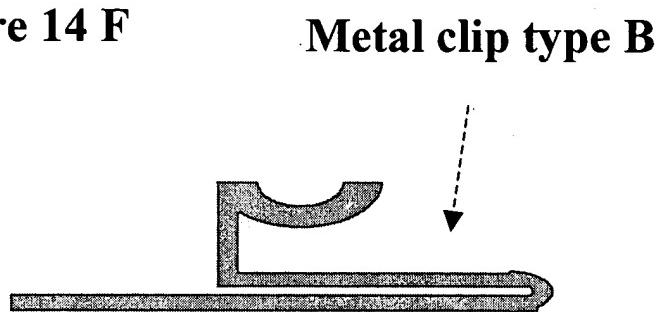
**Figure 14 D**



**Figure 14 E**



**Figure 14 F**



**Figure 14 G**

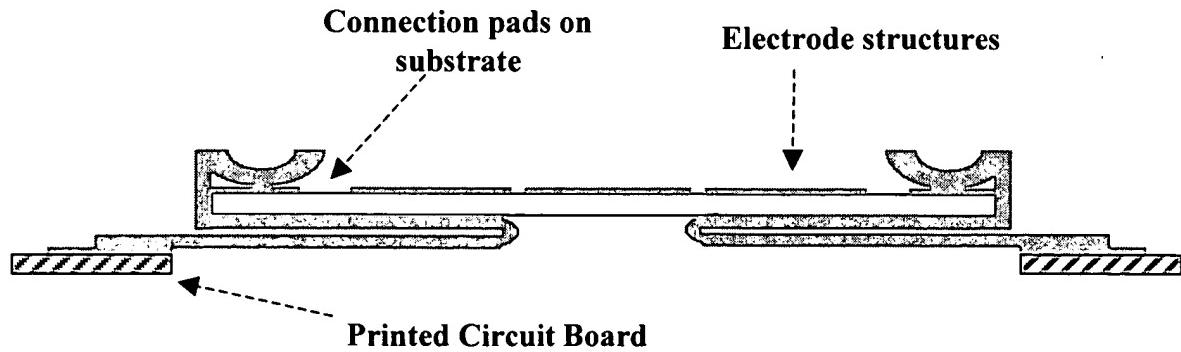


Figure 15(A)

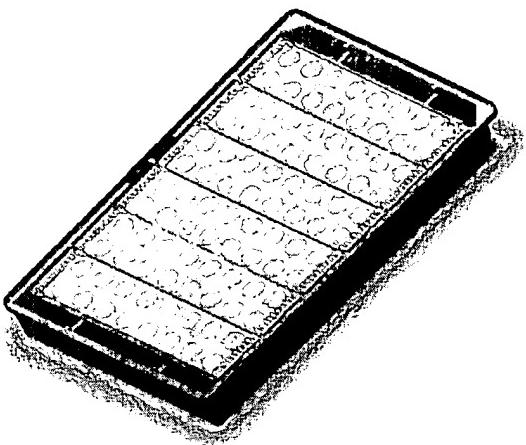


Figure 15(B)

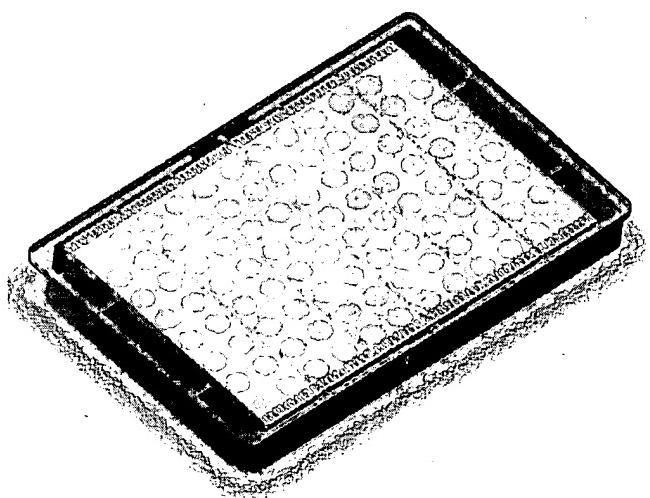
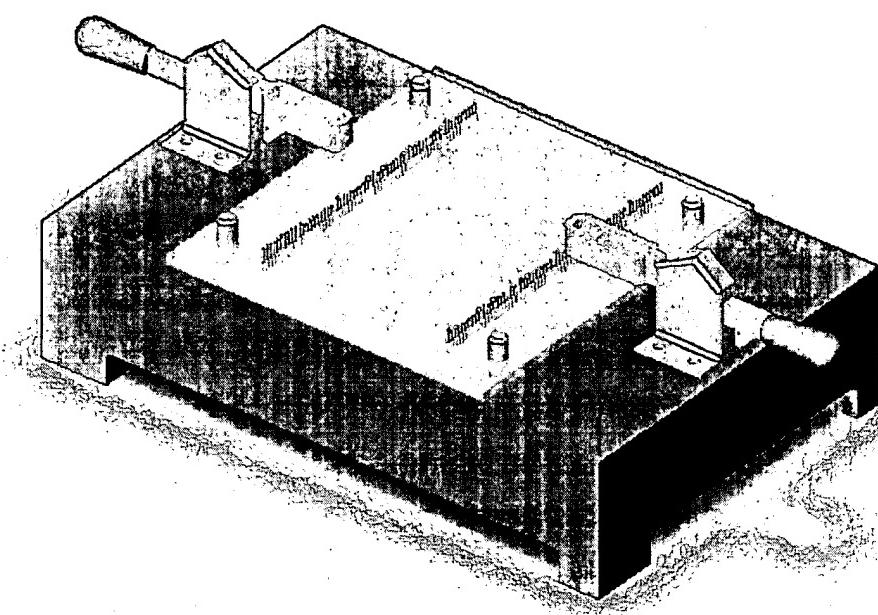


Figure 16.



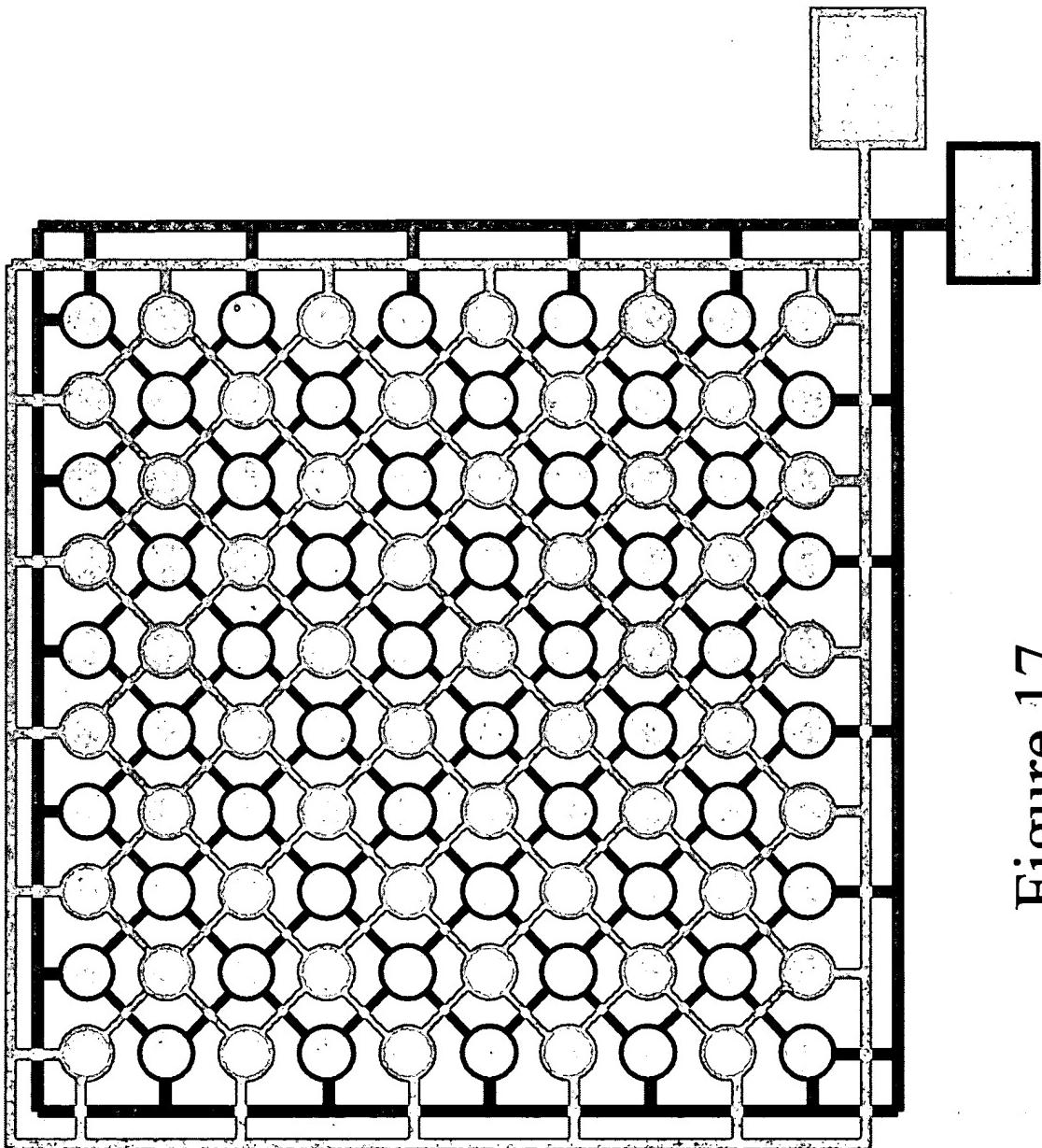


Figure 17

**Figure 18**

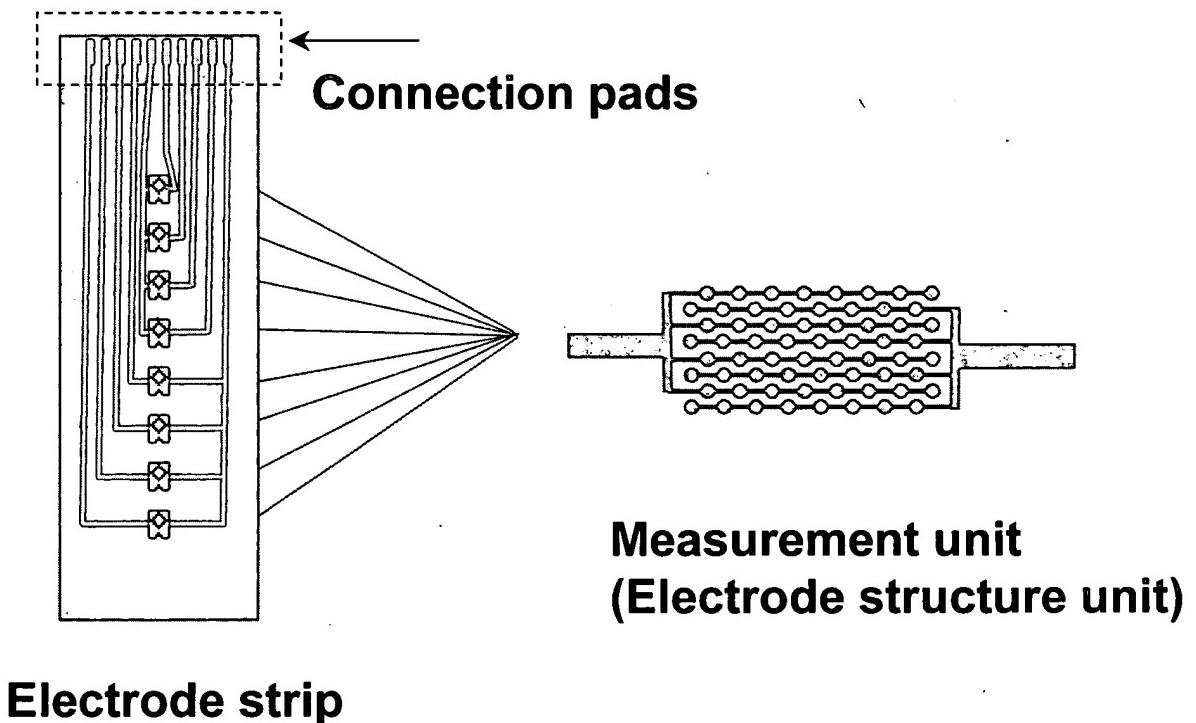
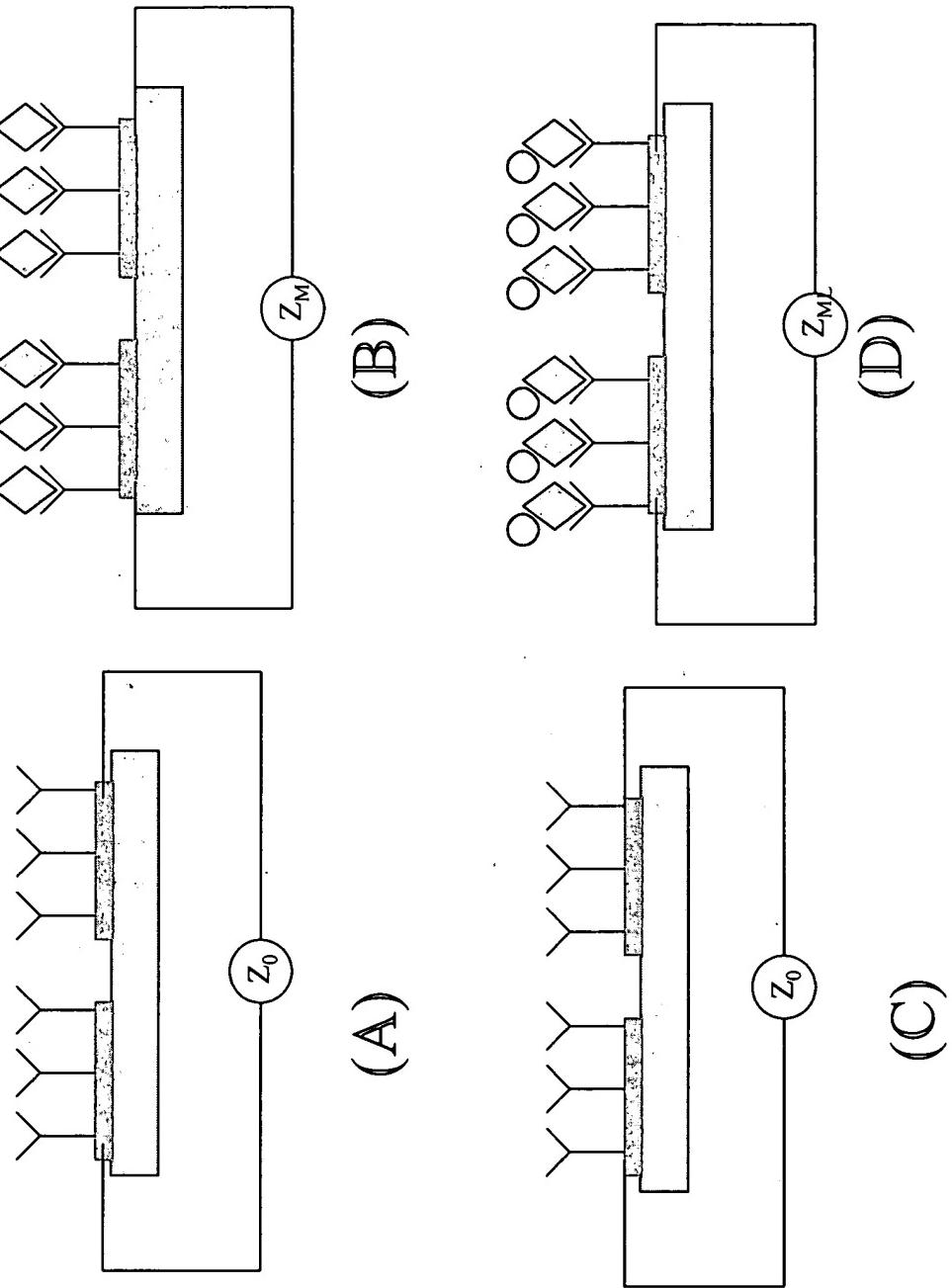
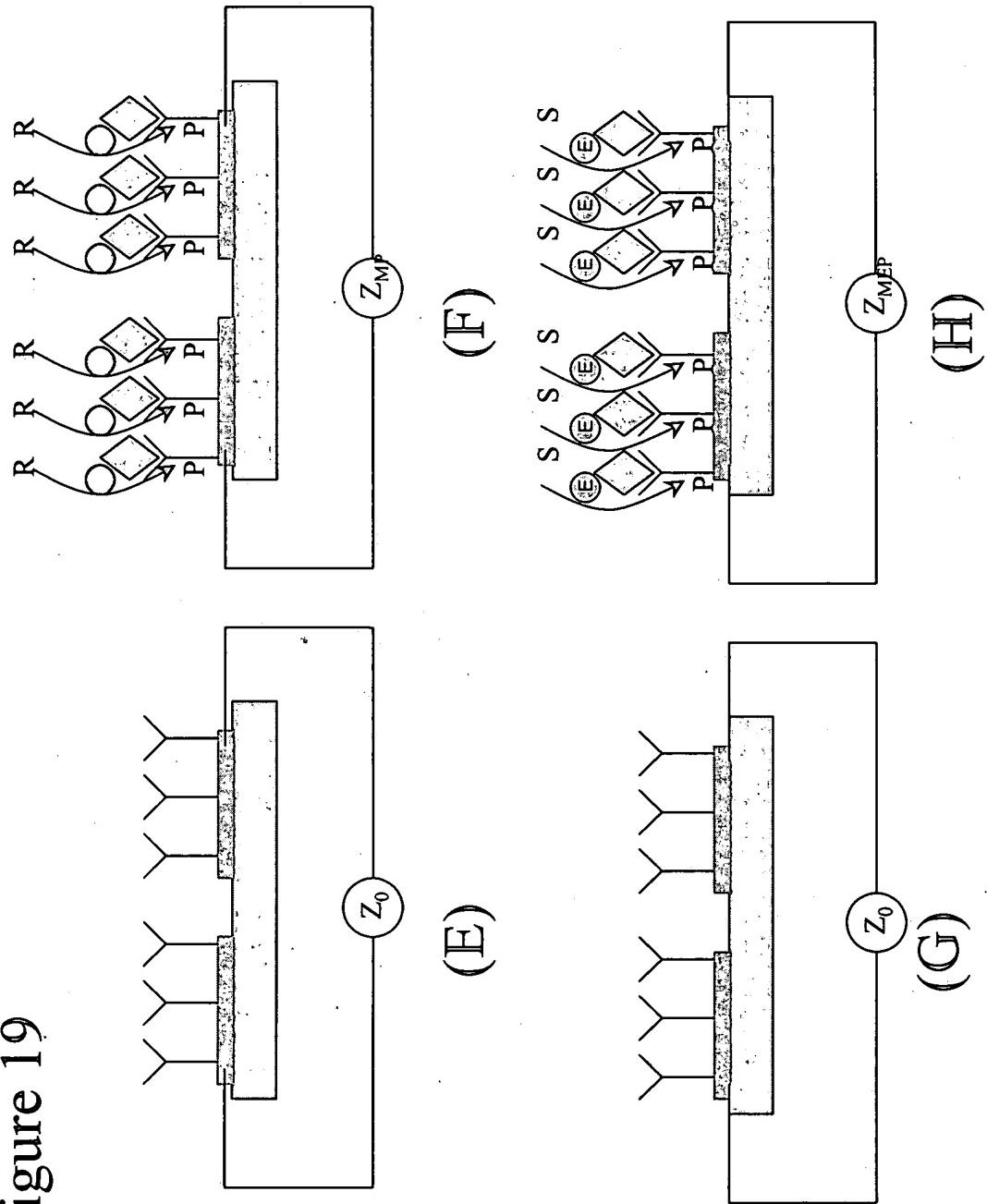


Figure 19



**Figure 19**



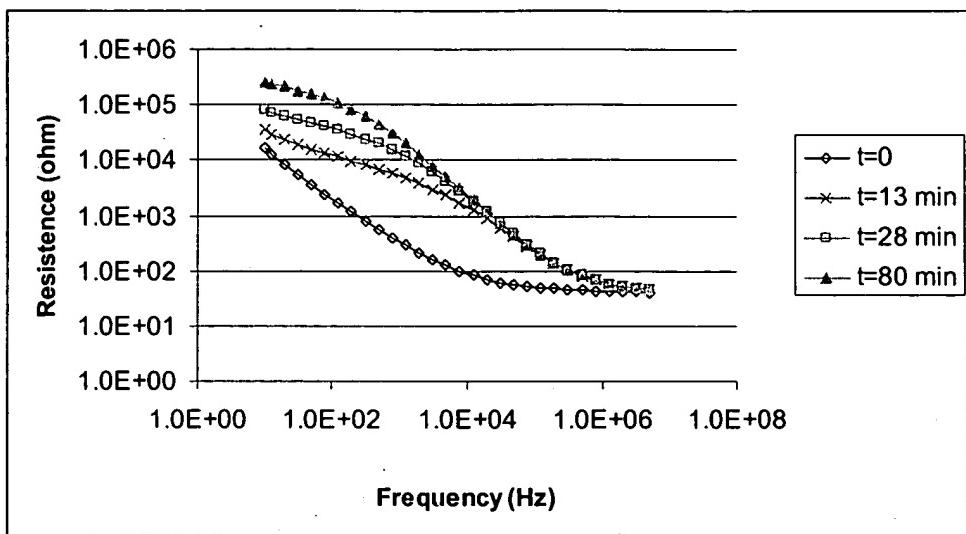


Figure 20 (A)

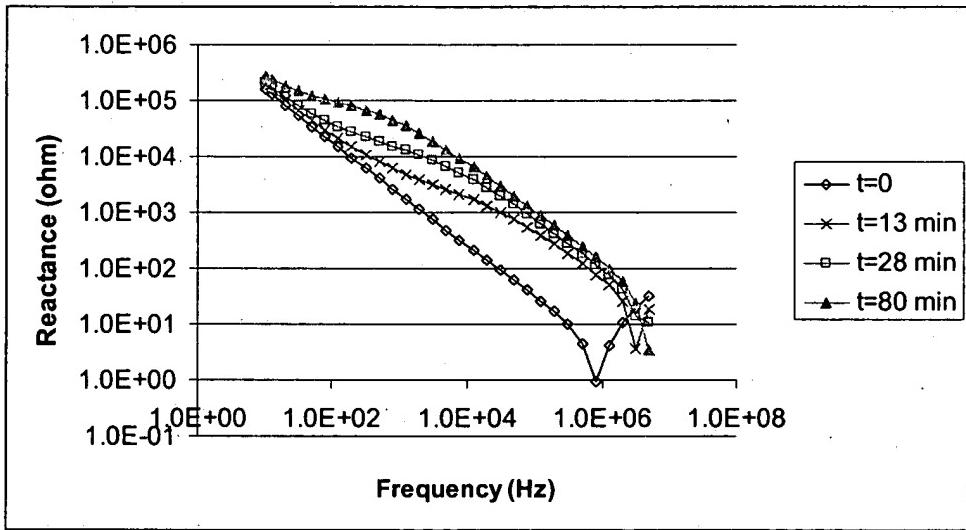


Figure 20 (B)

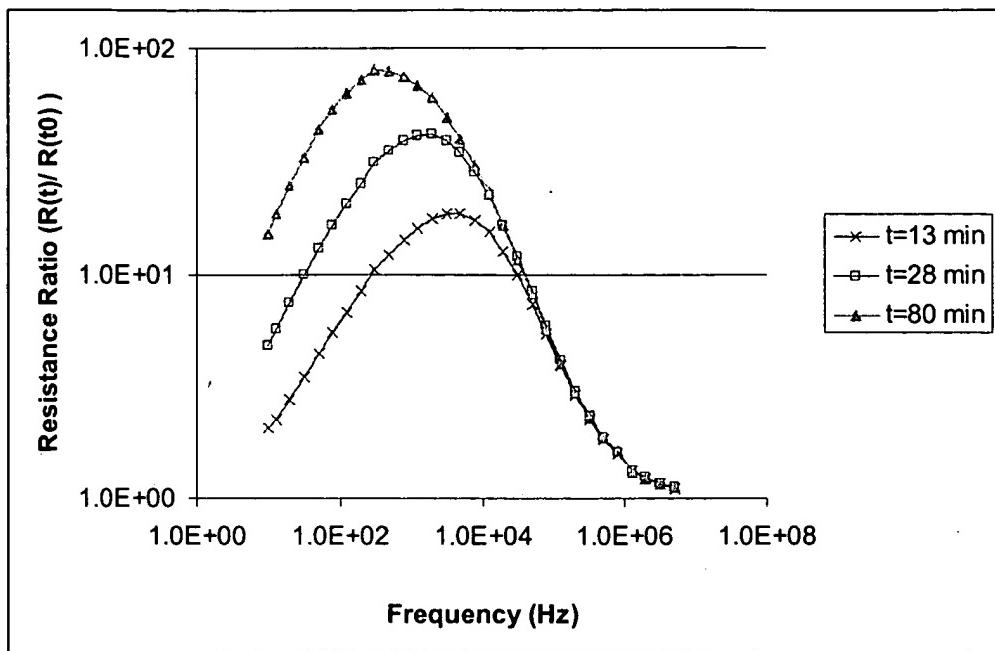


Figure 20(C )

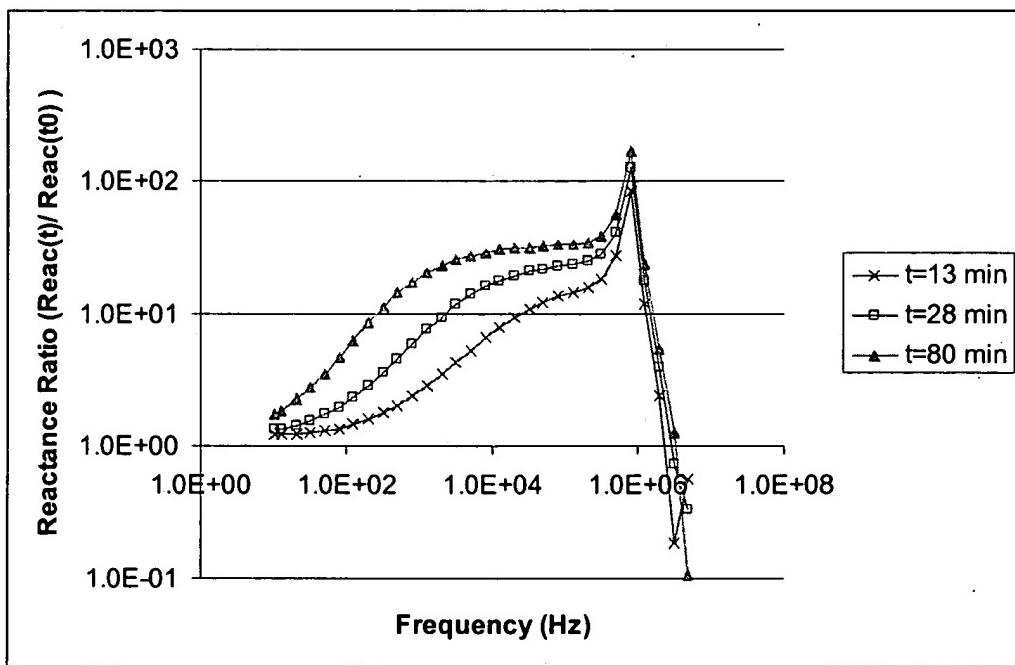


Figure 20(D)

### Detection of DNA Single Nucleotide Substitution on ACEA Device

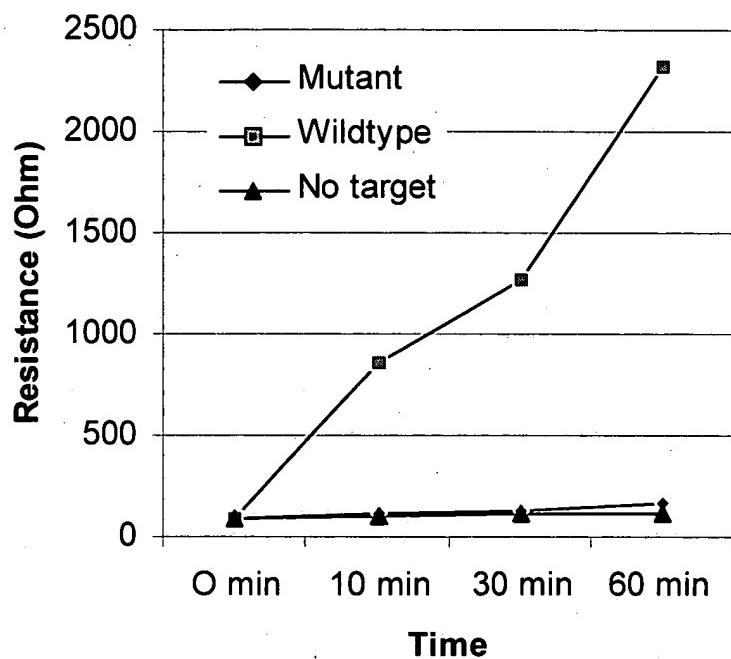
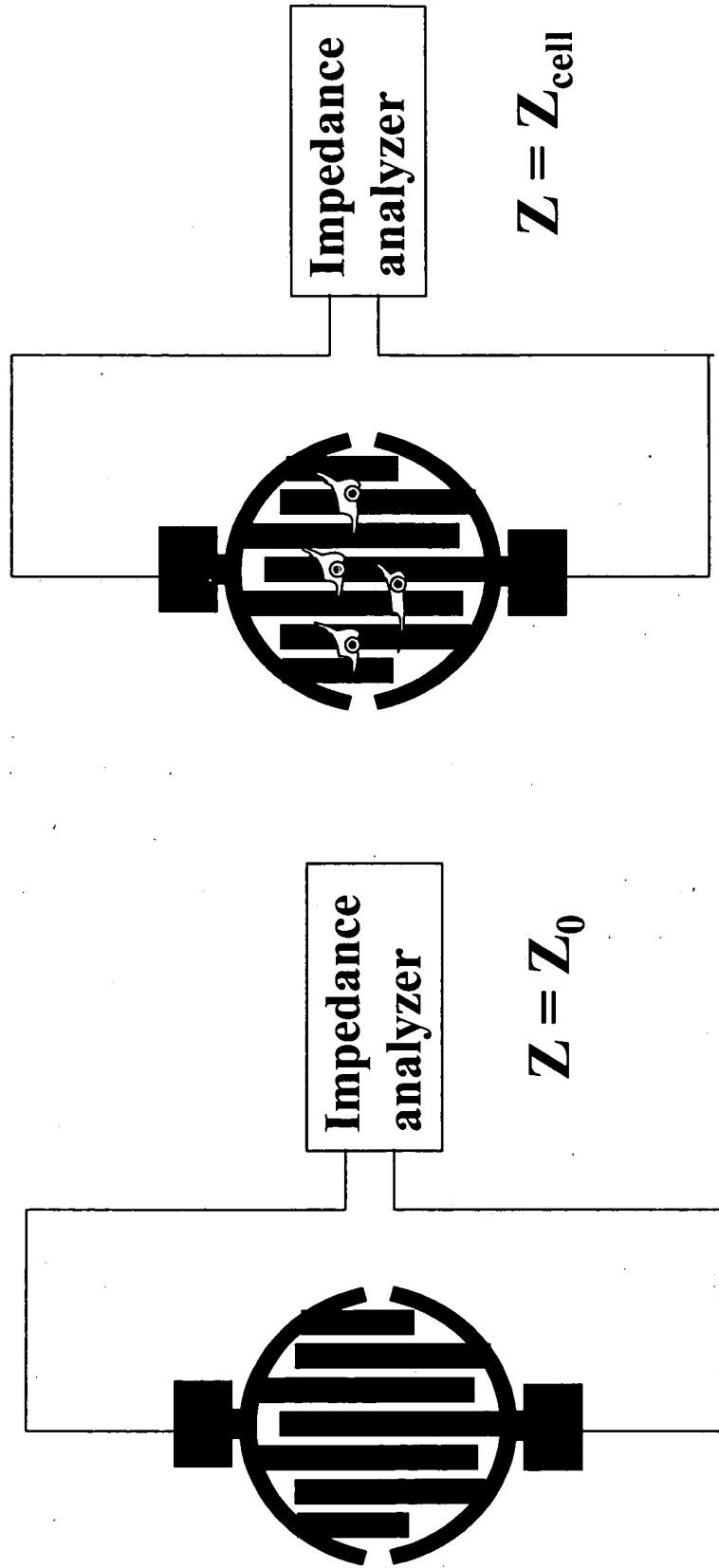


Figure 21.

Figure 22



**Figure 23**

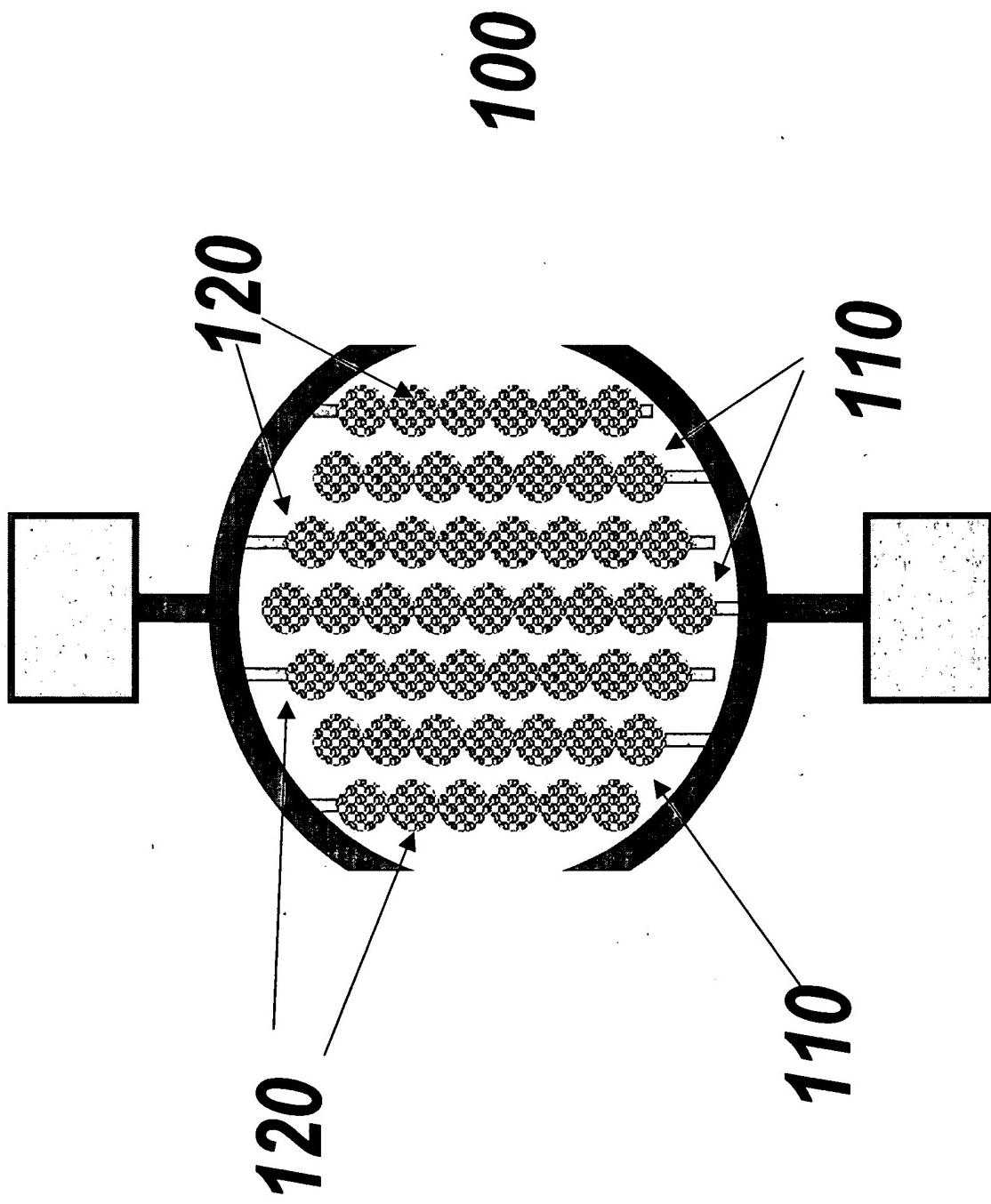


Figure 24

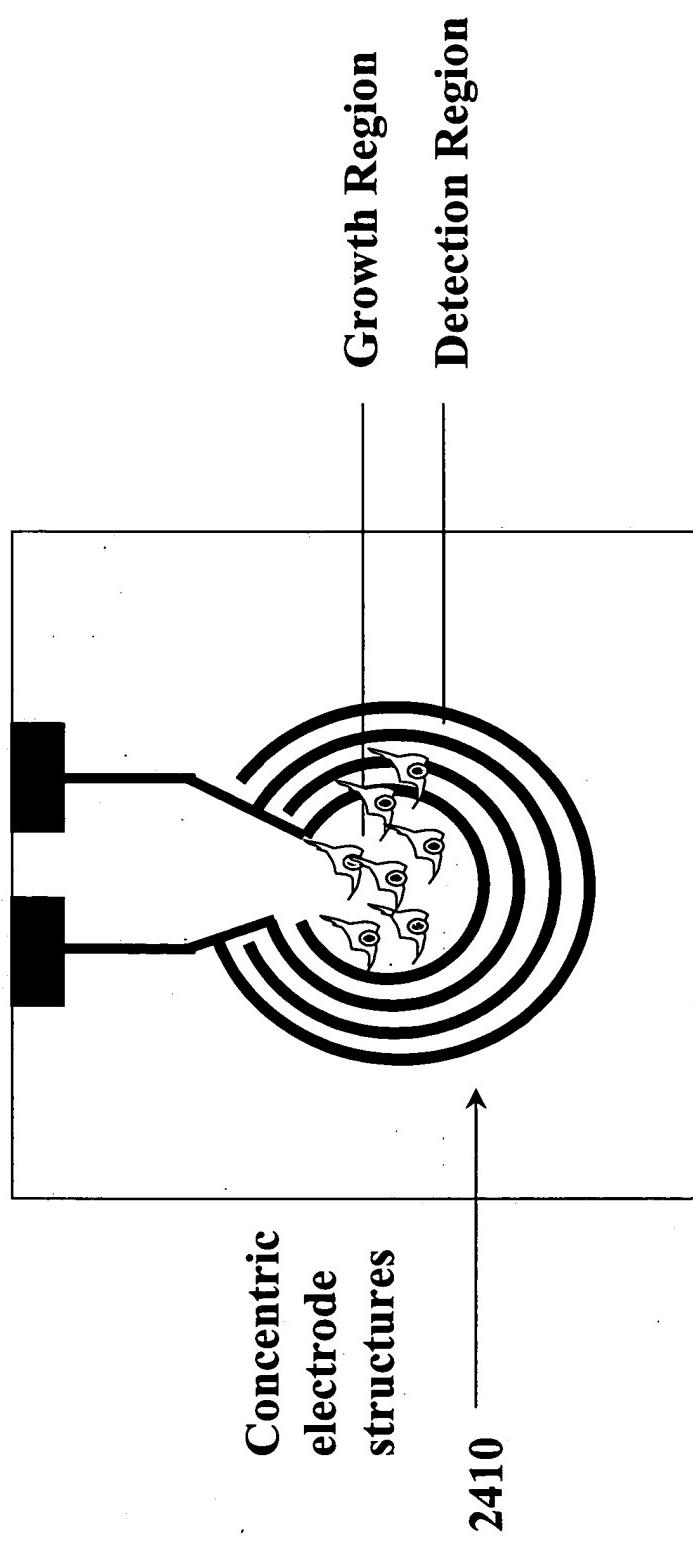
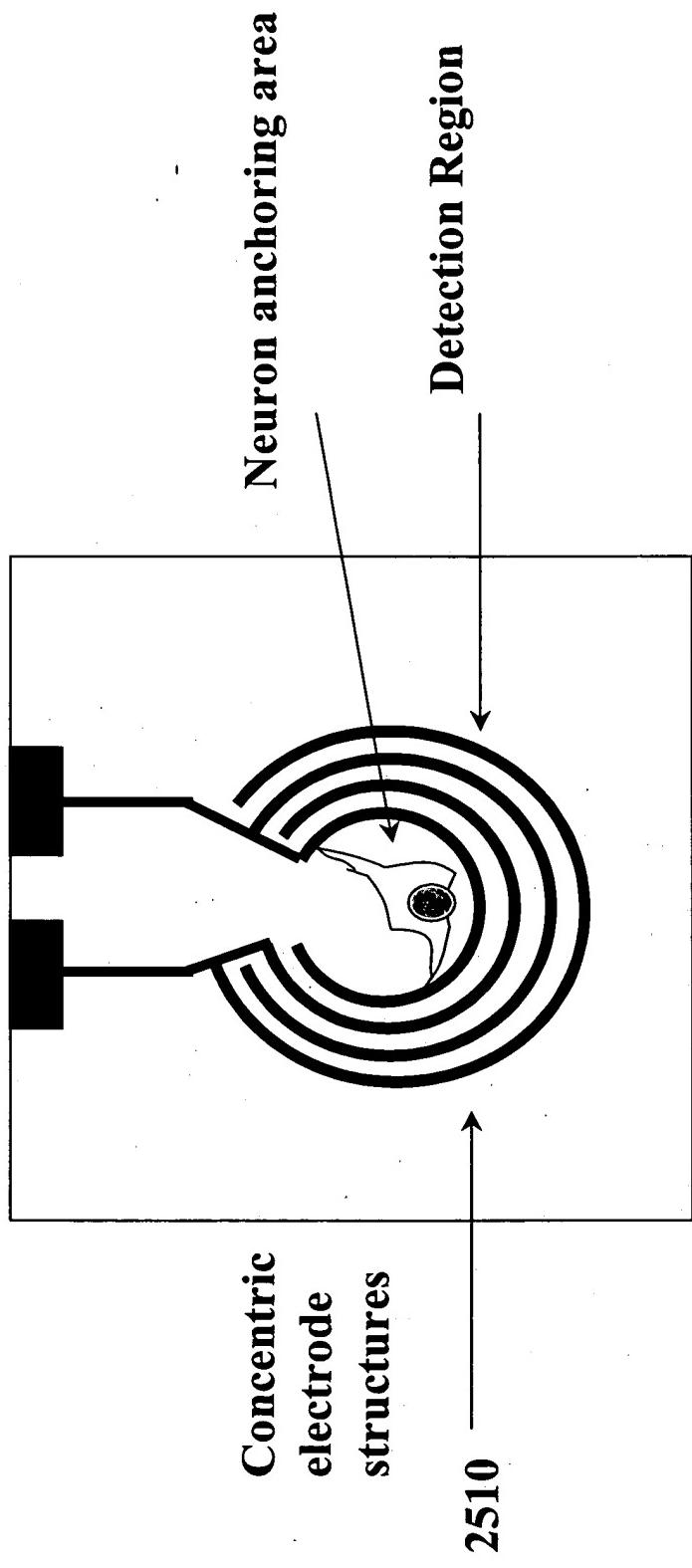
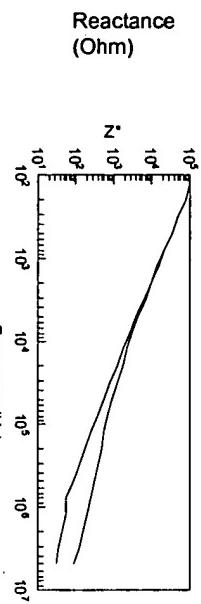
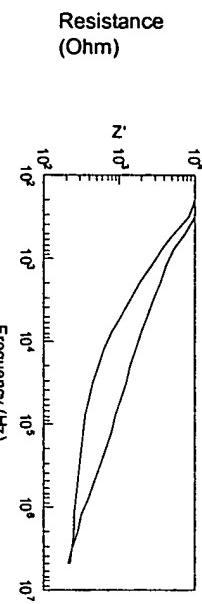


Figure 25

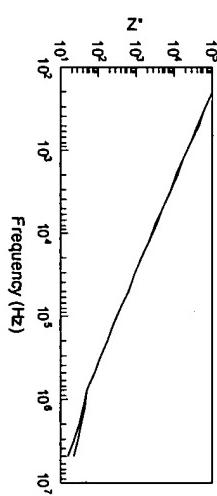


**Figure 26A (1)**  
2AA

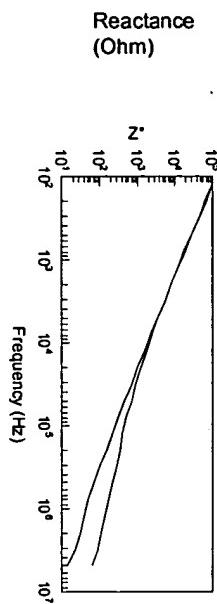
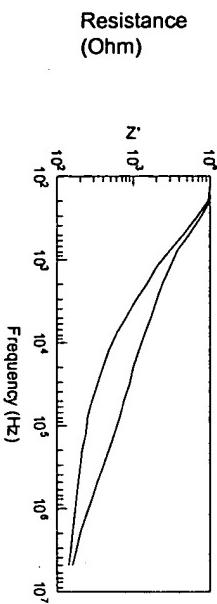
2AA (No cells attached)



2AB



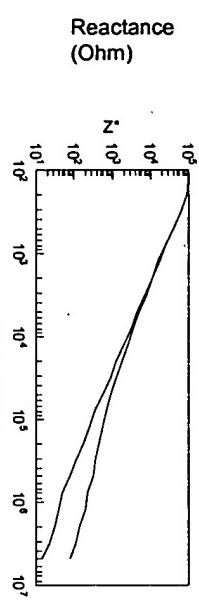
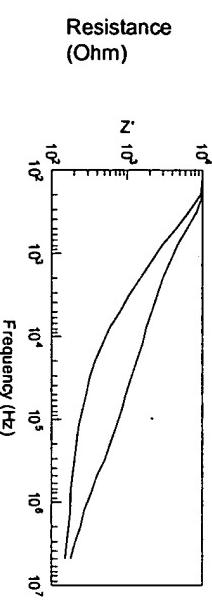
2AB (No cells attached)



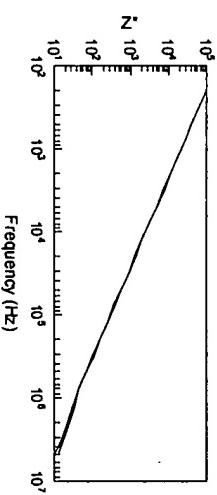
**Figure 26A (2)**

2AC

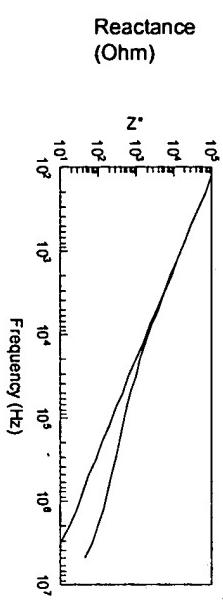
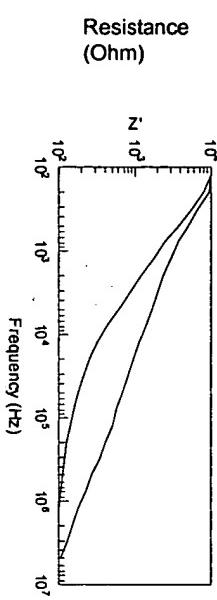
2AC No Cells attached



2AD



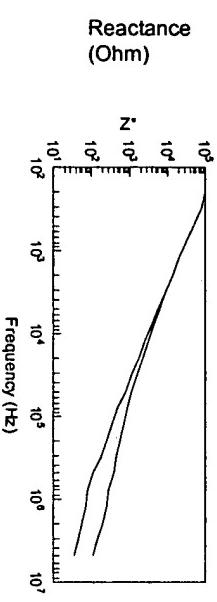
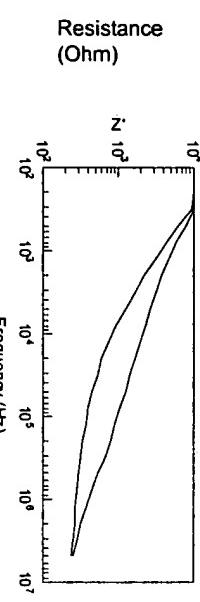
2AD (No cells attached)



**Figure 26A (3)**

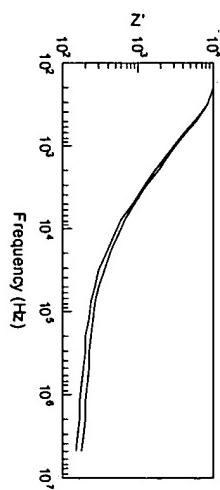
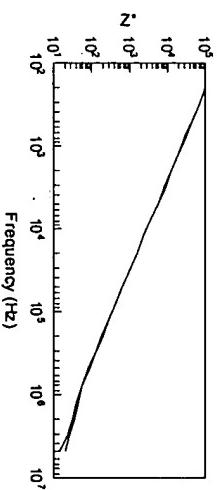
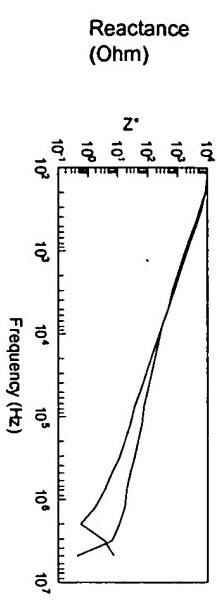
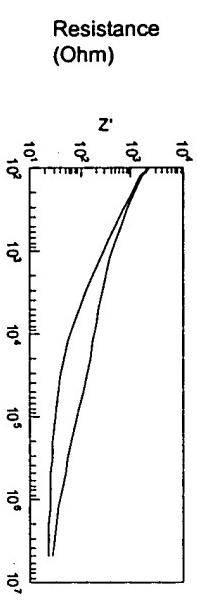
3A

3A (No cells attached)



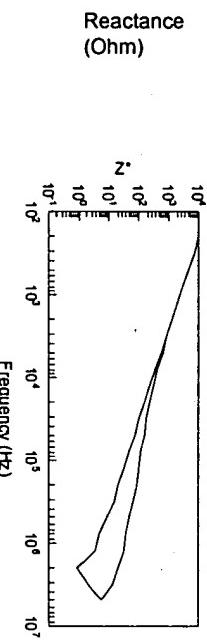
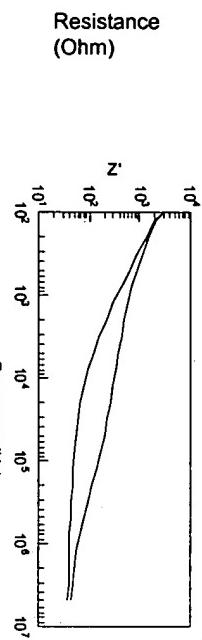
2BE

2BE No cells attached



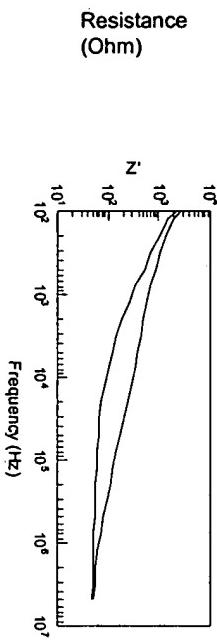
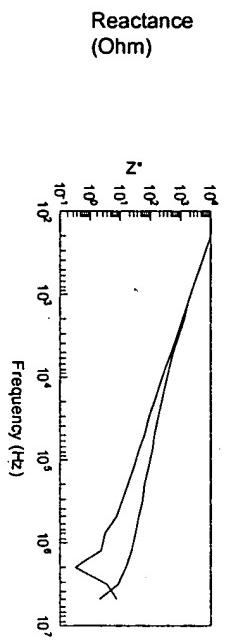
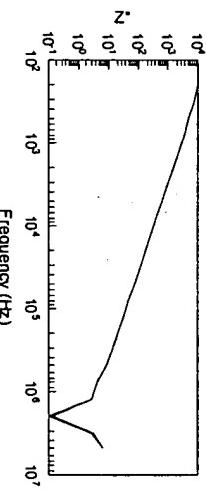
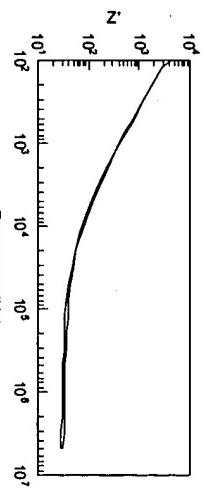
**Figure 26A (4) 3B**

**3B No cells attached**



**3C**

**3C No cells attached**



**Figure 26B**

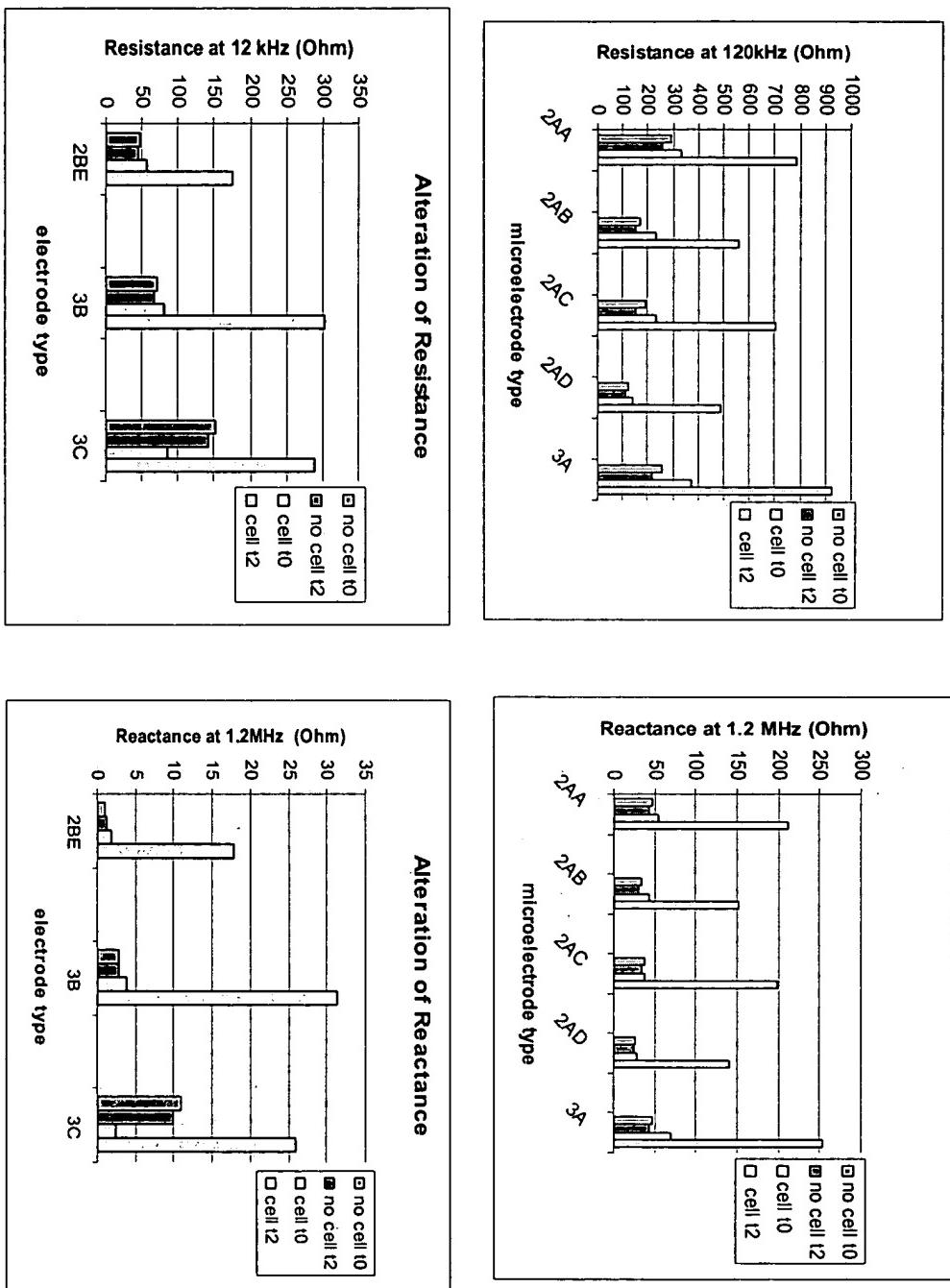


Figure 27

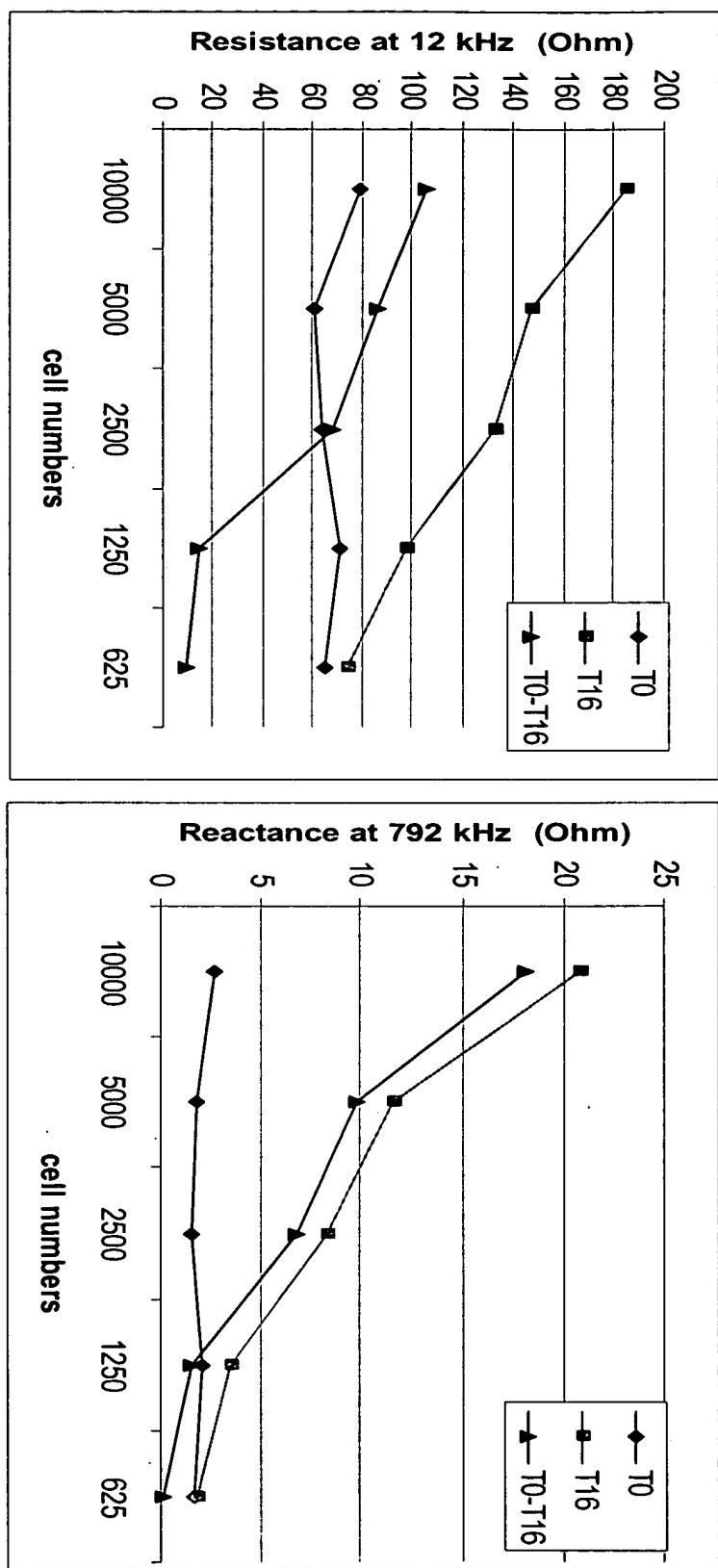


Figure 28

## NIH 3T3 and PAE Cell Proliferation

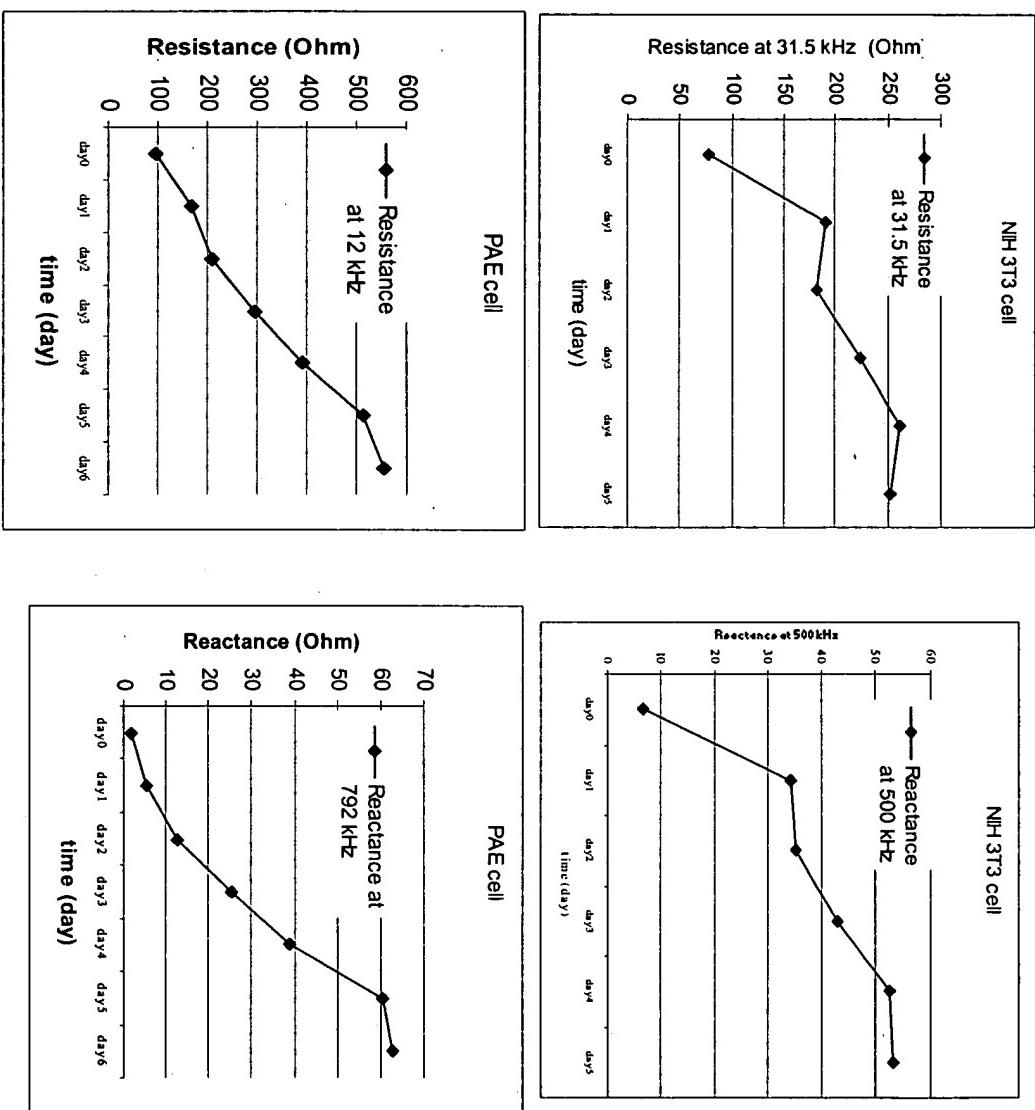


Figure 29

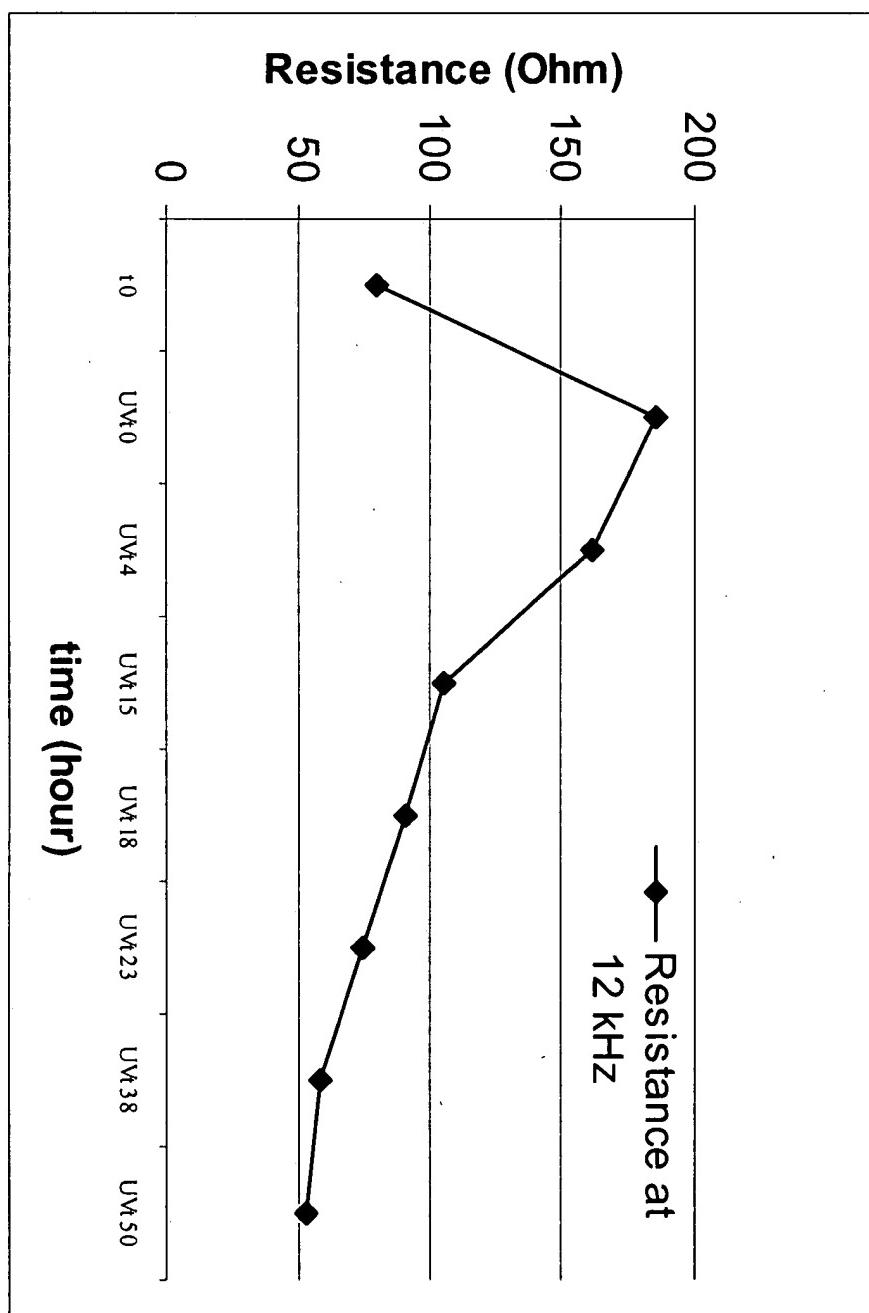


Figure 30

## Tamoxifen IC<sub>50</sub>s at different time intervals (NIH 3T3 Cell line)

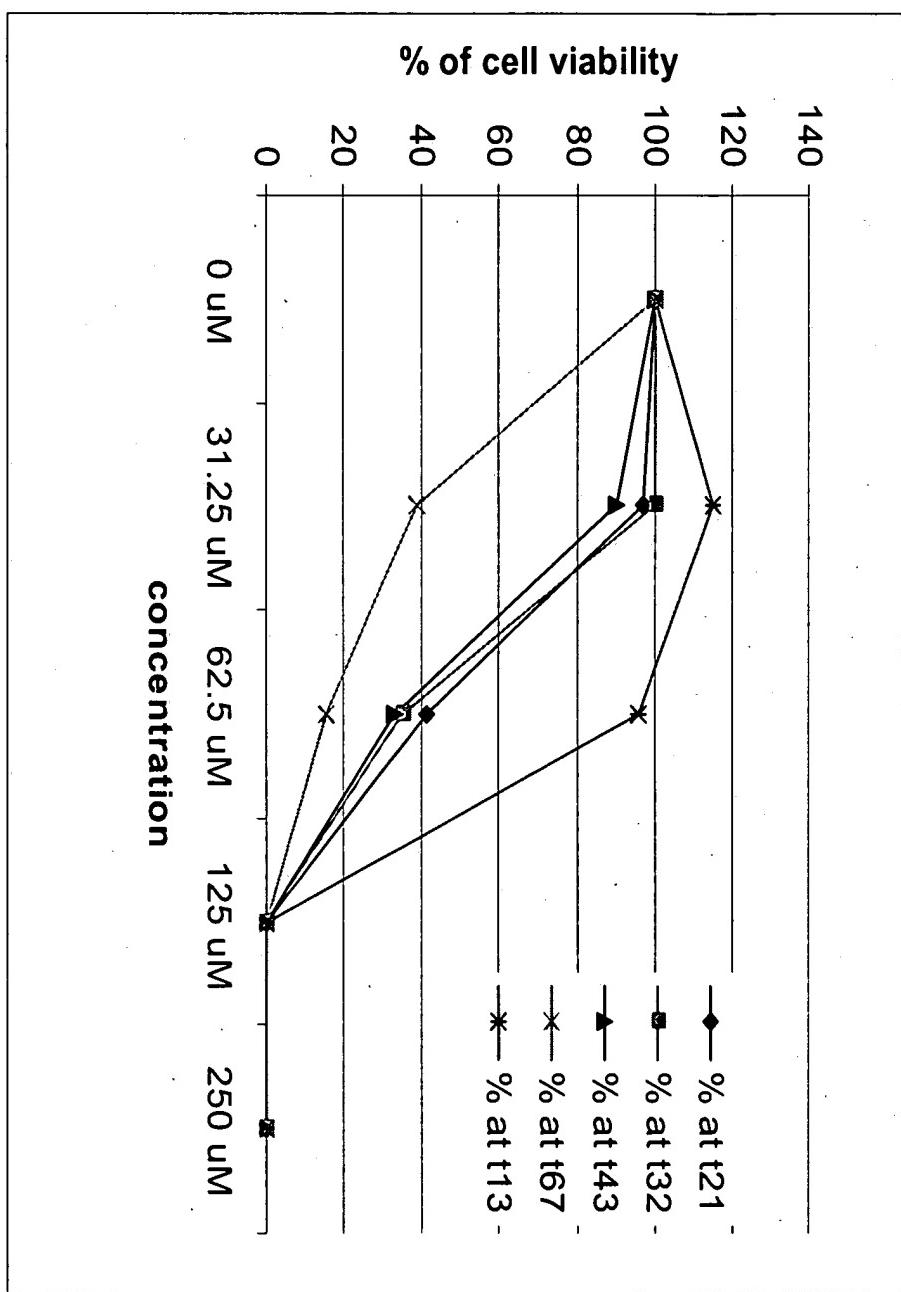
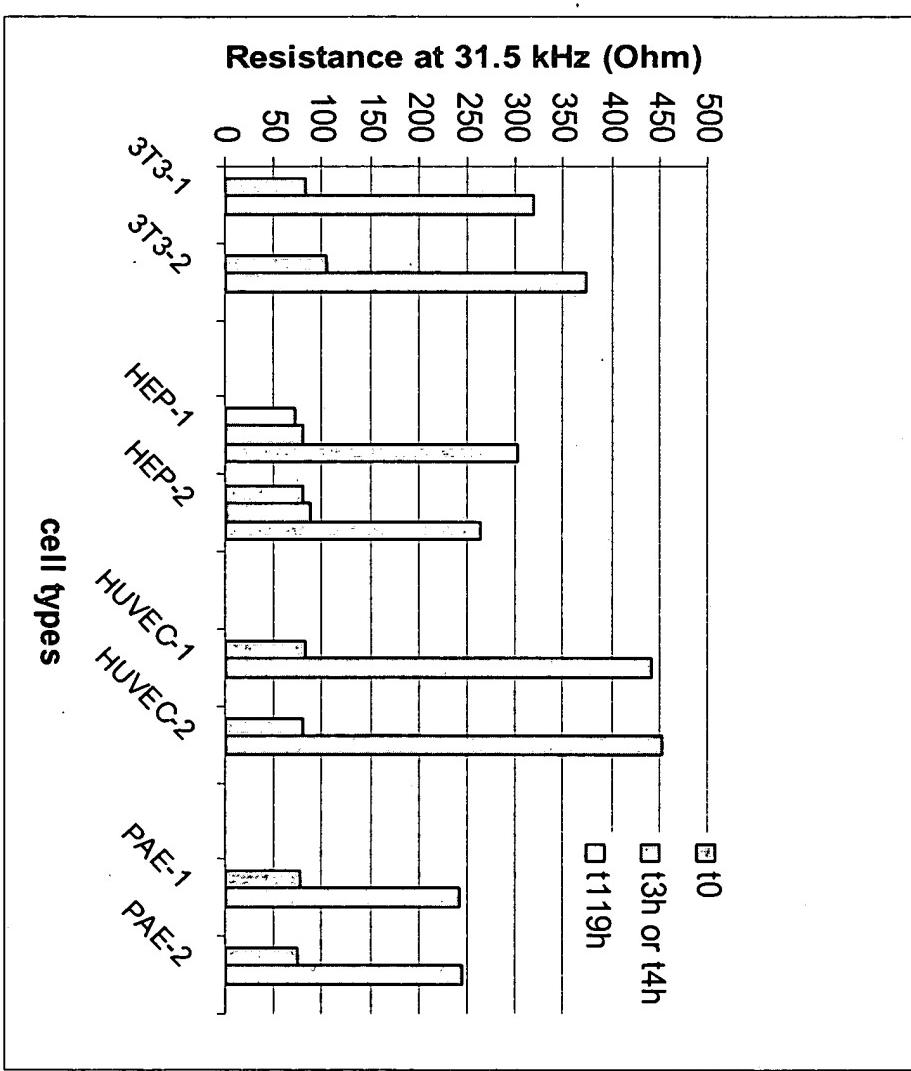


Figure 31



**Figure 32**

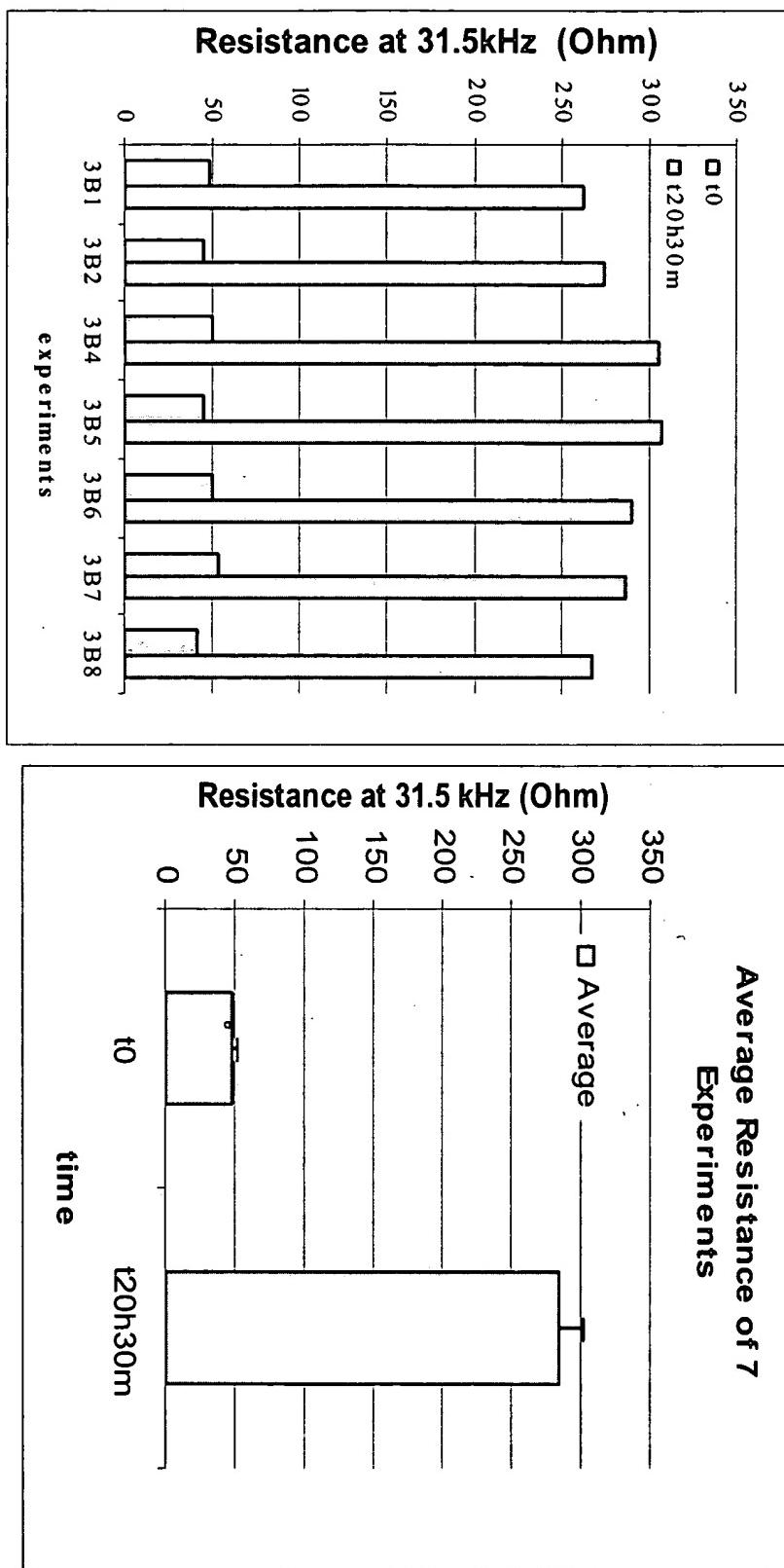


Figure 33.

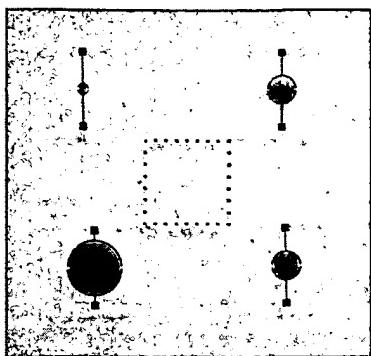


Figure 34.

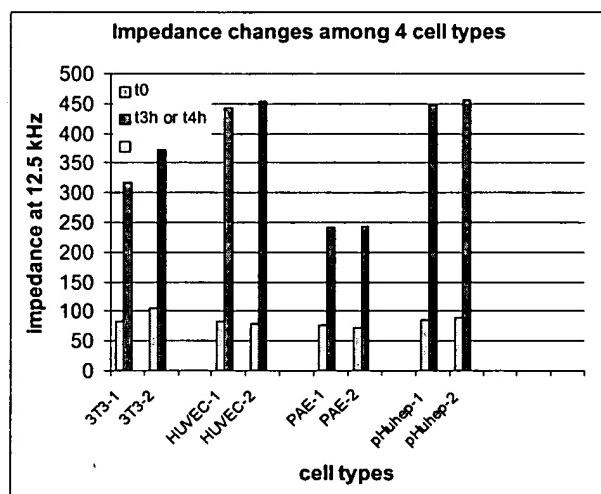


Figure 35.

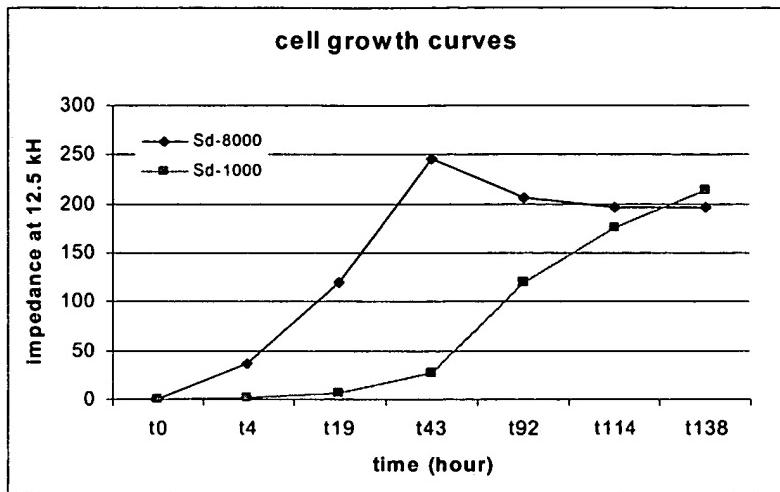


Figure 36.

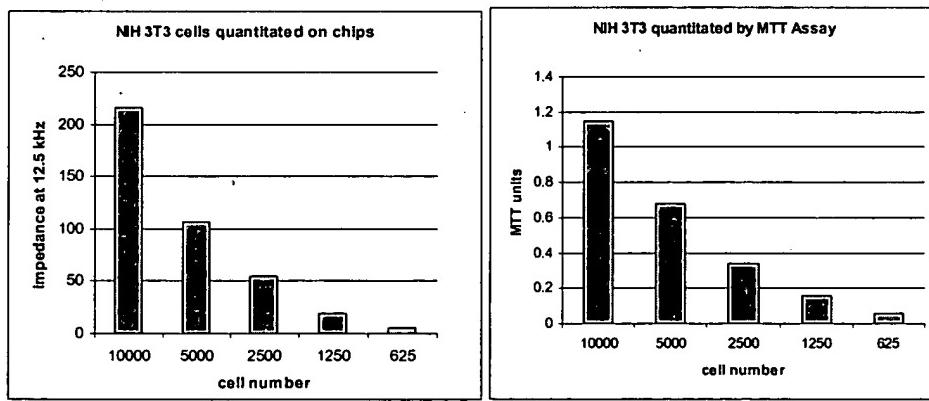


Figure 37.

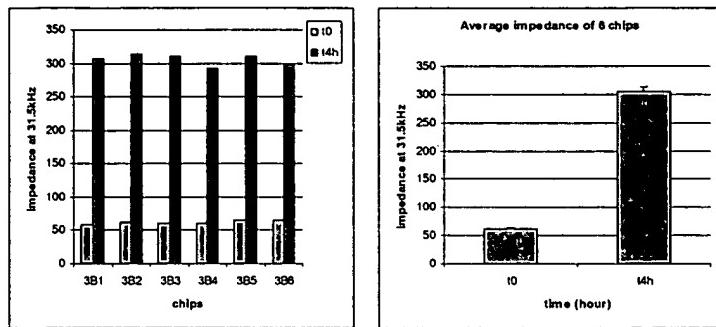


Figure 38(A).

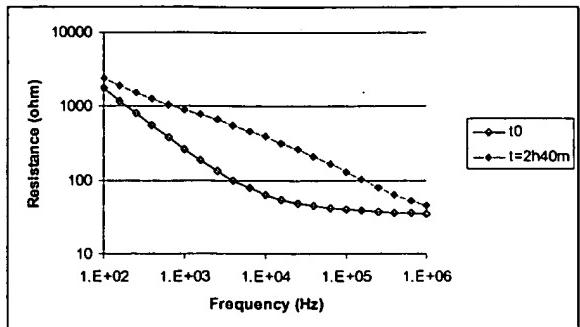


Figure 38(B)

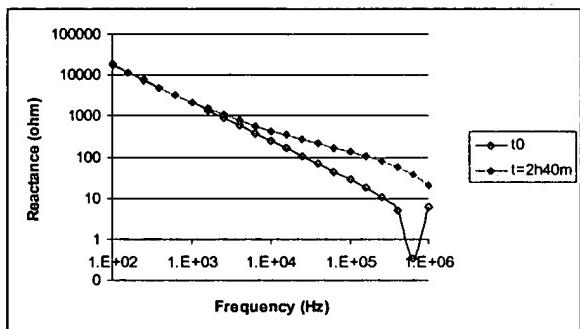


Figure 38(C)

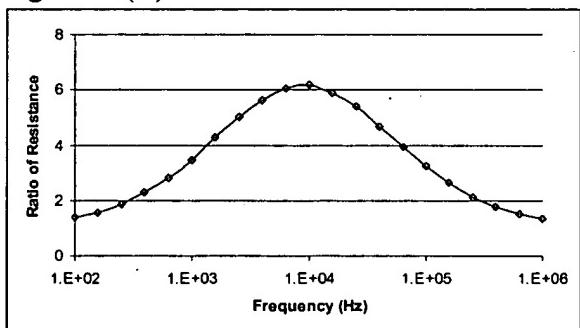


Figure 38(D)

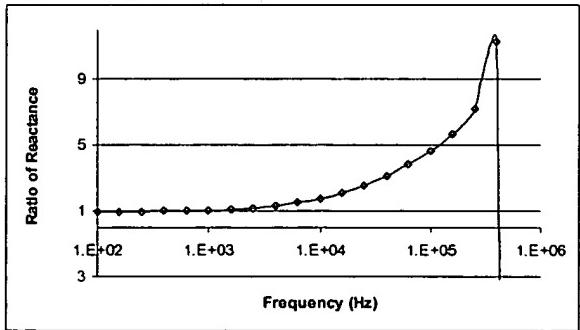


Figure 39(A)

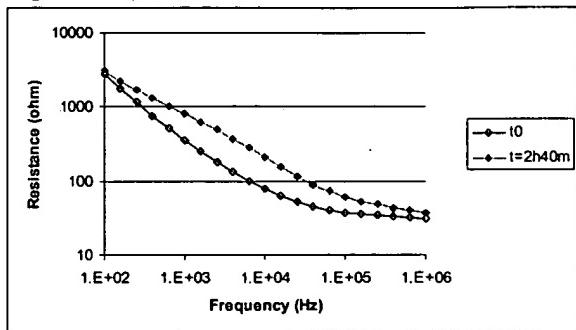


Figure 39(B)

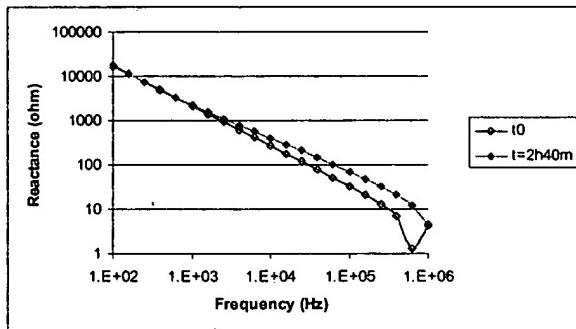


Figure 39(C)

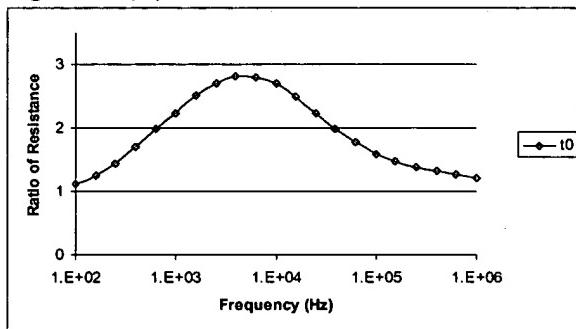


Figure 39(D)

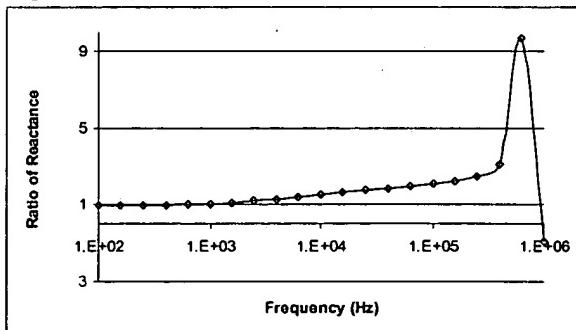


Figure 40(A)

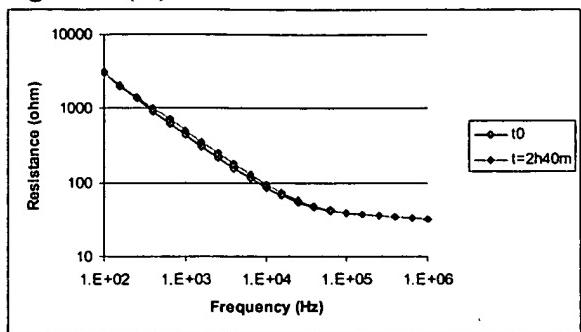


Figure 40(B)

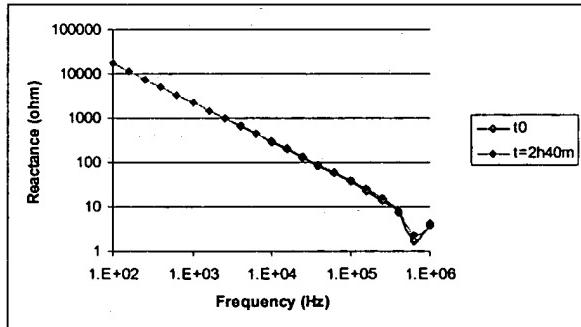


Figure 40(C)

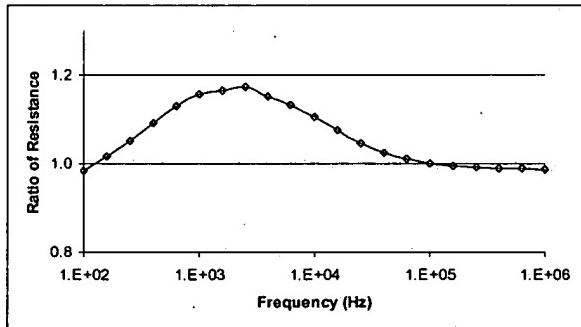


Figure 40(D)

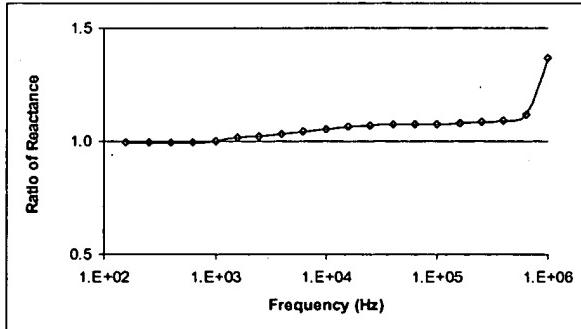


Figure 41(A)

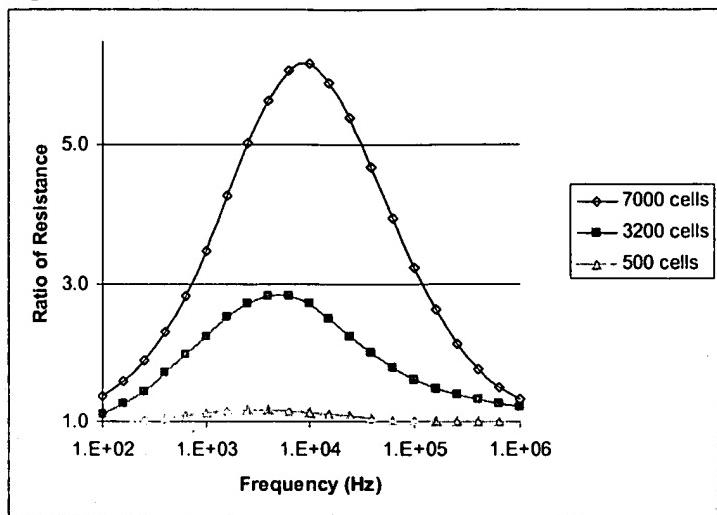
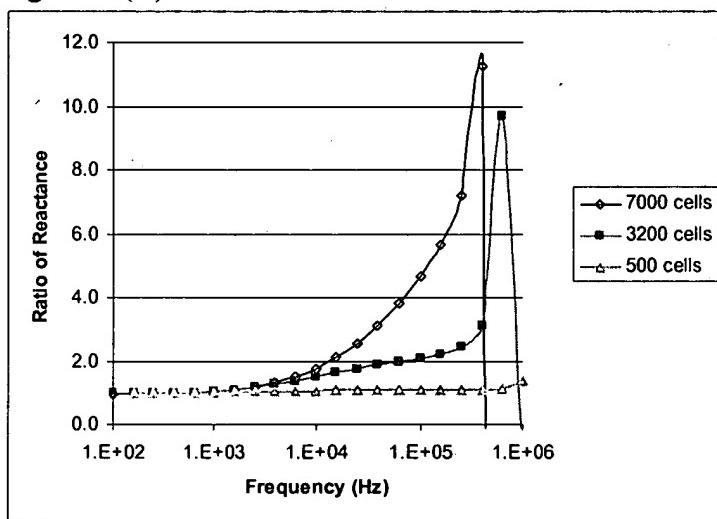
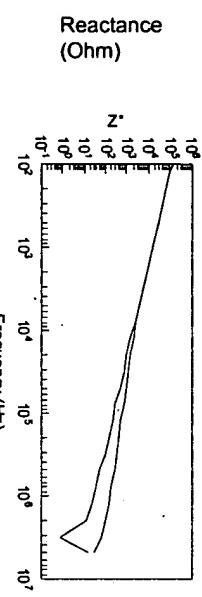
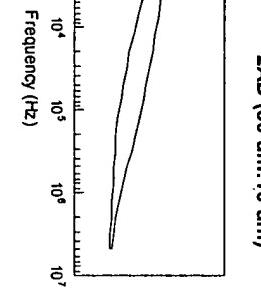
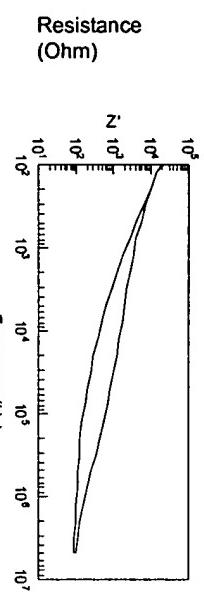


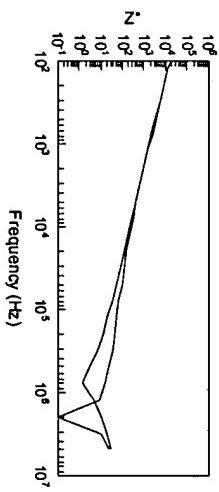
Figure 41(B)



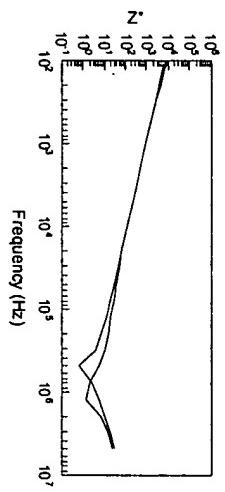
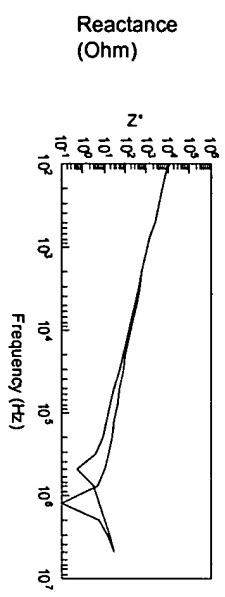
**Figure 42 A**  
**2AD (50 um:10 um)**



**2CF (48 um:28 um)**



**50 um : 50 um**



**Figure 42 B**

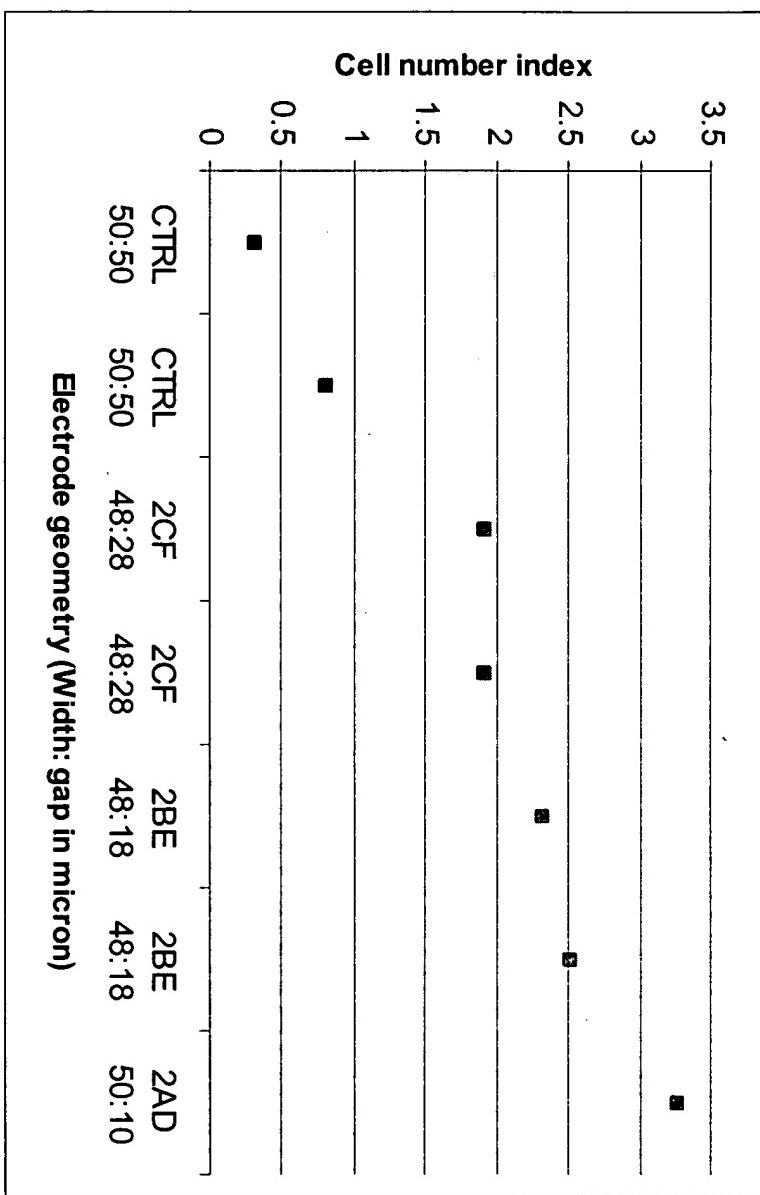


Figure 43

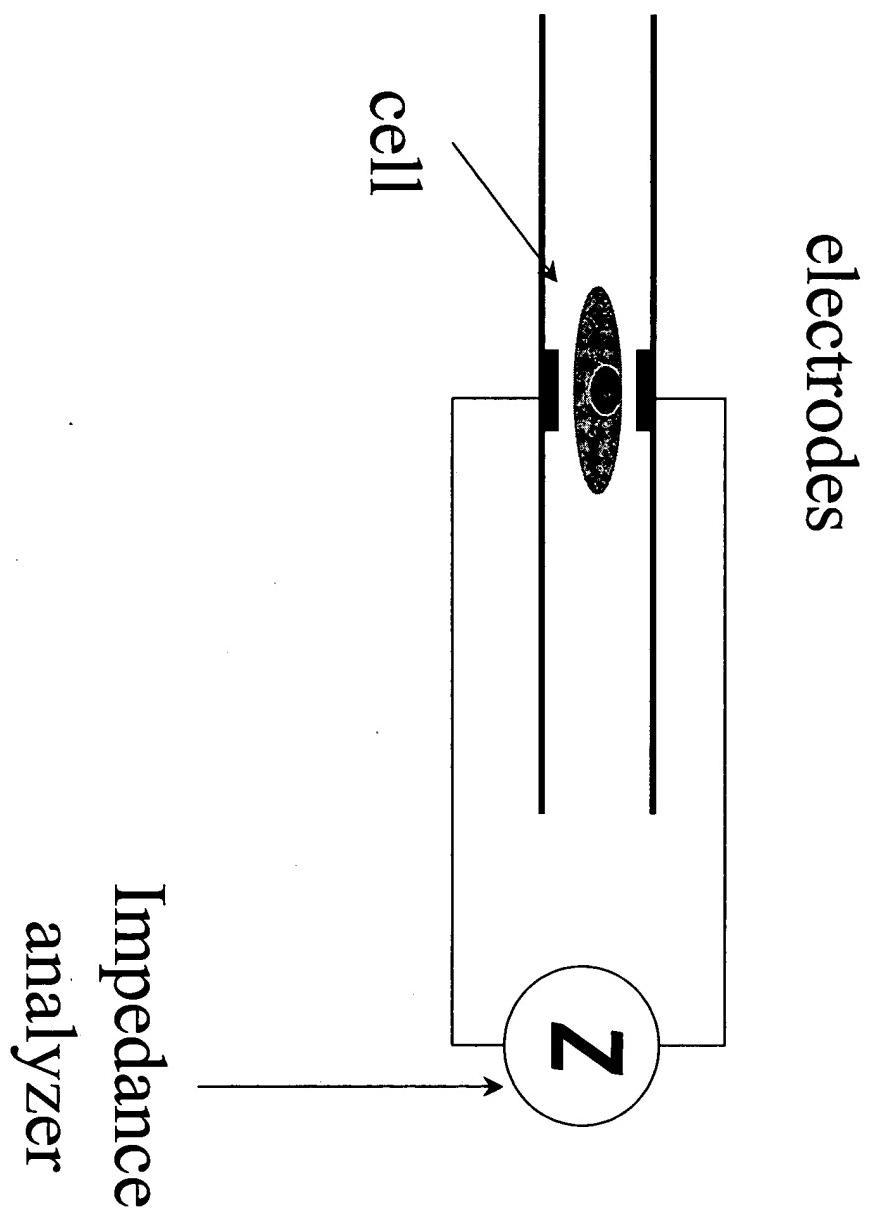


Figure 44

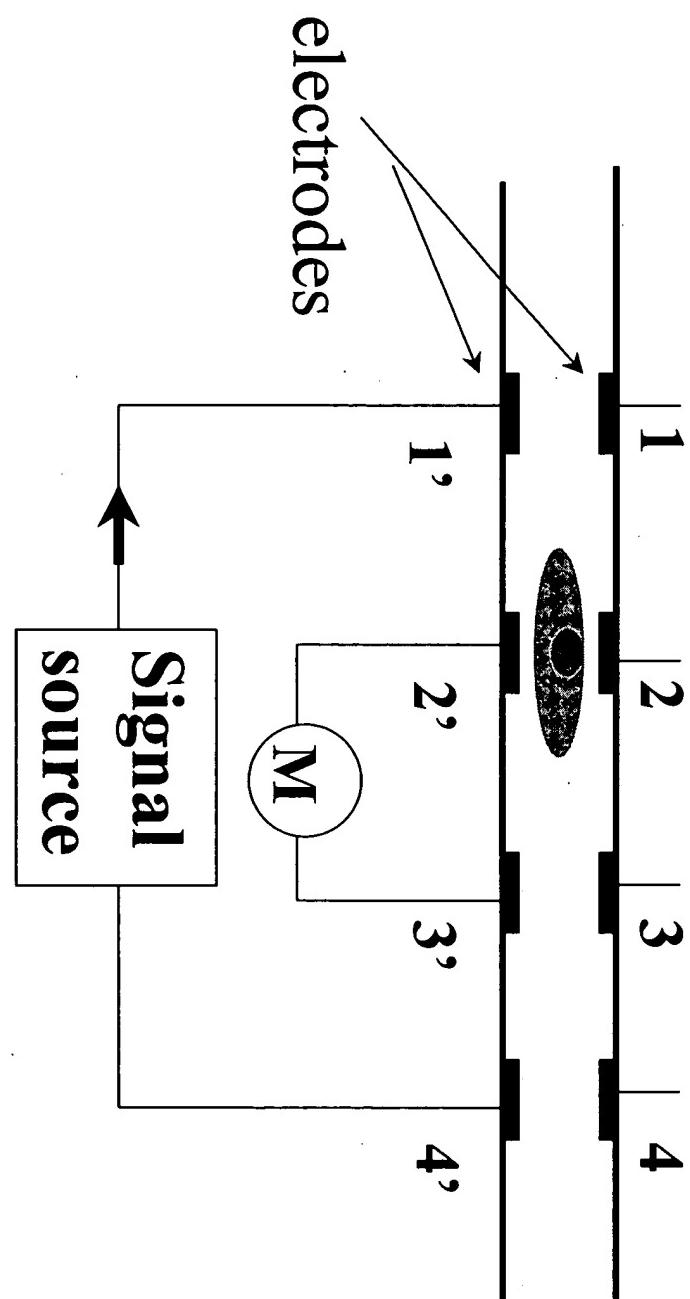


Figure 45

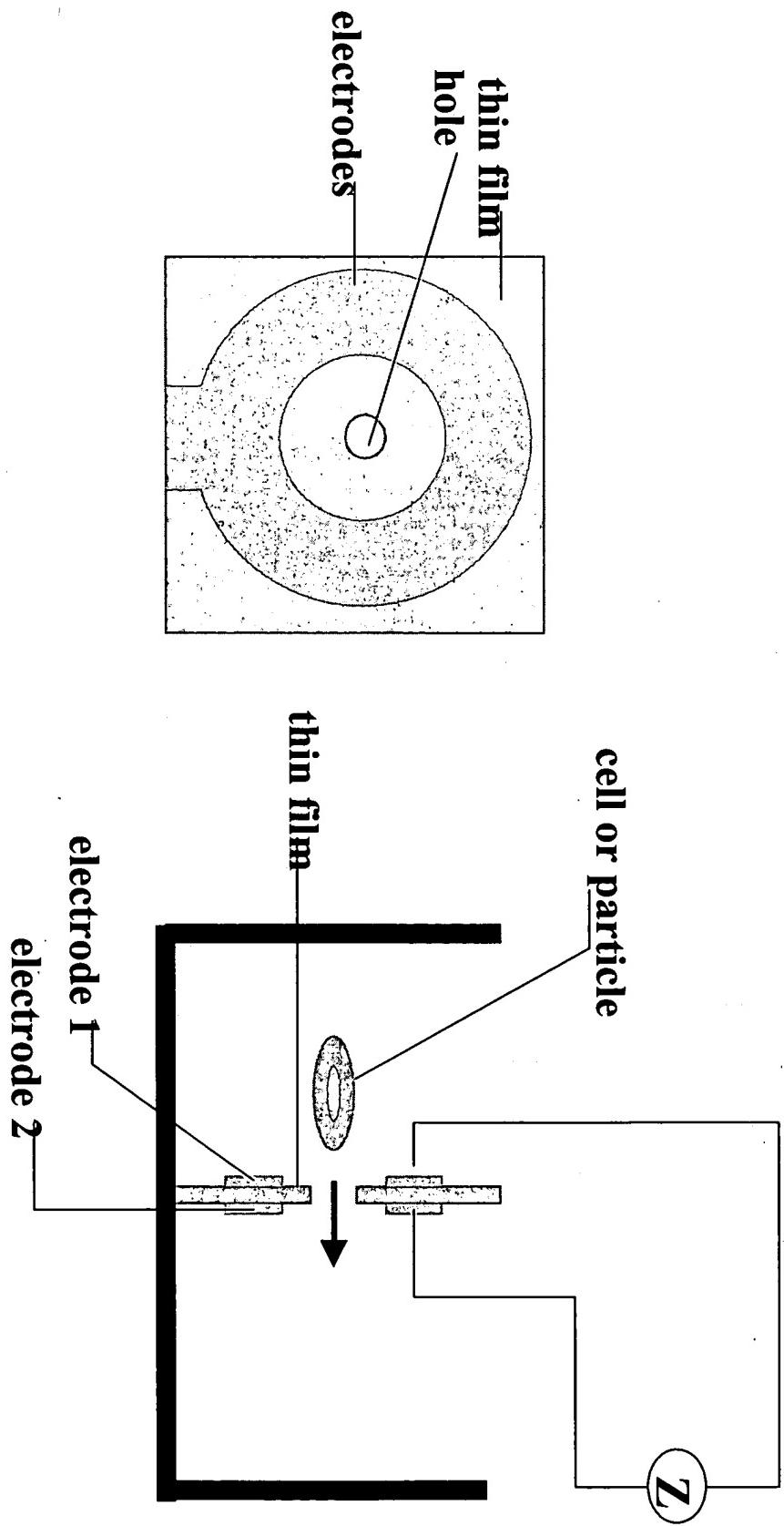


Figure 46

